

# General Catalog

UNIVERSITY OF CALIFORNIA, RIVERSIDE

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## 2011-2012

### On the Path to Excellence

We welcome you to the University of California, Riverside, at an exciting time:

With the implementation of a new 10-year plan to move the campus to a higher level of excellence in every aspect of campus life, we are seeing our faculty and their research gaining greater and greater recognition on the national and international stage.

Every week brings news of new awards and new discoveries. News stories about our desirability as a campus, our success in graduating students, our retention rates are abounding as never before.

What does that mean for you?

It means that you will spend the next few years with faculty members who are striving for ever greater advances in research, who are seeking better and more relevant ways to address societal needs, and are reaching for ever more innovative forms of expression.

It means that you can expect a campus that welcomes you with your rich blend of history and experience. It means that you can expect to find academic opportunities that will advance your individual dreams and aspirations, whether they take the form of undergraduate research, mentorships, or specialized tutoring. The standards will be high. The expectations that you will grow intellectually, personally and socially into well-rounded citizens will be even higher.

It means that UCR will continue to lead the nation as a bastion of excellence through diversity – of people, ideas, perspectives, learning opportunities and experiences. And this campus will continue to stand out among UCs as a place where everyone feels welcome and respected.



And finally, it means that UCR will continue to foster partnerships and relationships with the off-campus community, whether it be our neighbors down the street or those on the other side of the globe. We take seriously our commitment to contribute to the community by using our research to address society's problems and promote public good.

So we invite you to join us on this adventure towards excellence and to contribute to the common good with your intellect, your spirit and your heart.



Timothy P. White  
Chancellor

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## How to Obtain the Catalog

Copies of the 2011-2012 University of California, Riverside General Catalog are available on iBooks and Kindle for \$4.99. A PDF version for desktops is also available. For more information, please visit [www.catalog.ucr.edu](http://www.catalog.ucr.edu).

**Note** Prices are subject to change without notice.

## Please note

Every effort has been made to ensure the accuracy of the information presented in the *University of California, Riverside General Catalog*. However, all courses, course descriptions, instructor designations, curricular degree requirements, and fees described herein are subject to change or elimination without notice. Students should consult the appropriate department, school, college, or graduate division for current information, as well as for any special rules or requirements imposed by the department, school, college, or graduate division.

The *2011-2012 University of California, Riverside General Catalog* and prior issues are available online at [catalog.ucr.edu](http://catalog.ucr.edu). Other campus Web sites providing similar information may not reflect current approved curricula or course information.

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# Degrees



Discipline	B.A.	B.S.	M.A.	M.S.	Ph.D.
Administrative Studies <sup>1</sup>	•	•			
African American Studies	•				
Anthropology	•	•	•	•	•
Anthropology/Law and Society	•				
Art (Studio)	•				
Art History	•		•		
Art History/Administrative Studies	•				
Art History/Religious Studies	•				
Asian American Studies	•				
Asian Literatures and Cultures	•				
Asian Studies	•				
Biochemistry	•	•			
Biochemistry and Molecular Biology				•	•
Biological Sciences <sup>3</sup>		•			
Biology	•	•			
Biomedical Sciences		•		• <sup>2</sup>	•
Biomedical Sciences					M.D.-Ph.D.
Business Administration (see also Management)		•			
Business Economics	•				
Business Informatics		•			
Cell, Molecular, and Developmental Biology	•	•		•	•
Chemistry	•	•		•	•
Chicano Studies	•				
Classical Studies	•				
Classics			• <sup>2</sup>		•
Comparative Ancient Civilizations	•				
Comparative Literature (graduate program)			•		•
Computer Science <sup>6</sup>		•		•	•
Creative Writing	•				
Creative Writing and Writing for the Performing Arts			M.F.A.		
Critical Dance Studies			• <sup>2</sup>		•
Economics	•		•		•
Economics/Administrative Studies	•				
Economics/Law and Society	•				
Education <sup>4</sup>			• <sup>5</sup>		•
Education			M.Ed.		
Engineering					
Bioengineering <sup>6</sup>		•		•	•
Chemical <sup>6</sup>		•			
Chemical and Environmental				•	•
Computer <sup>6</sup>		•			
Electrical <sup>6</sup>		•		•	•
Environmental <sup>6</sup>		•			
Materials Science and Engineering		•		•	•
Mechanical <sup>6</sup>		•		•	•
English	•		•		•
Entomology	•	•		•	•
Environmental Sciences	•	•			
Environmental Sciences <sup>3</sup>					
(Joint degree program with CSU Fresno)		•			
Environmental Sciences					
(Interdepartmental Graduate Program)				•	•
Environmental Toxicology				•	•
Ethnic Studies	•		• <sup>2</sup>		•
Evolution, Ecology, and Organismal Biology				•	•
Experimental Choreography			M.F.A.		

<sup>1</sup> Administrative Studies, and Law and Society are only offered as a major combined with other programs.

<sup>2</sup> Applications are not accepted from students wishing to work toward the master's degree only.

<sup>3</sup> New student registration in this program is not open at present.

<sup>4</sup> See Graduate School of Education section for credential program information.

<sup>5</sup> Also joint programs with teaching fields of Anthropology, Biology, English, French, Geological Sciences, Germanic Studies, History, Mathematics, Music, Political Science, Psychology, Sociology, and Spanish.

<sup>6</sup> A combined B.S.+M.S. program is offered in this discipline (designed to lead to a B.S. degree as well as an M.S. degree in five years).

# Degrees

Discipline	B.A.	B.S.	M.A.	M.S.	Ph.D.
Genetics, Genomics, and Bioinformatics				• <sup>2</sup>	•
Geological Sciences				•	•
Geology		•			
Geophysics		•			
Geoscience Education	•				
Global Studies	•				
History	•		•		•
History/Administrative Studies	•				
History/Law and Society	•				
Humanities, Arts, and Social Sciences Interdisciplinary	•				
Interdisciplinary Studies <sup>3</sup>	•				
Languages and Literatures					
Comparative Literature	•				
French	•		• <sup>7</sup>		• <sup>8</sup>
Germanic Studies	•		• <sup>7</sup>		• <sup>8</sup>
Languages	•				
Latin American Studies	•				
Law and Society <sup>1</sup>	•				
Liberal Studies	•				
Linguistics	•				
Management			M.A., M.B.A.		•
Mathematics	•	•	•	•	•
Mathematics, Applied				•	
Mathematics for Secondary School Teachers		•			
Media and Cultural Studies	•				
Microbiology	•	•		• <sup>7</sup>	• <sup>7</sup>
Music	•		•		•
Music and Culture	•				
Native American Studies	•				
Neuroscience	•	•		• <sup>2</sup>	•
Pest Management				• <sup>7</sup>	
Philosophy	•		•		•
Philosophy/Law and Society	•				
Physical Sciences <sup>3</sup>	•				
Physics	•	•	•	•	•
Plant Biology	•	•		•	•
Plant Biology (Plant Genetics)					• <sup>7</sup>
Plant Pathology				•	•
Political Science	•		•		•
Political Science/Administrative Studies	•				
Political Science/International Affairs	•				
Political Science/Law and Society	•				
Political Science/Public Service	•				
Population Biology					• <sup>7</sup>
Psychology	•	•	• <sup>2</sup>		•
Psychology/Law and Society	•				
Public Policy	•				
Religious Studies	•		•		•
Russian Studies	•				
Sociology	•	•	• <sup>2</sup>		•
Sociology/Administrative Studies	•	•			
Sociology/Law and Society	•	•			
Soil and Water Sciences				• <sup>7</sup>	• <sup>7</sup>
Southeast Asian Studies			•		
Spanish	•		•		•
Statistics	•	•		•	
Statistics, Applied					•
Theatre	•				
Visual Art			M.F.A.		
Women's Studies	•				

<sup>7</sup> New student registration in this program is not open at present. For further information, contact the Graduate Division.

<sup>8</sup> Doctoral studies are available through the Ph.D. program in Comparative Literature.

## Undergraduate Minors

Arabic  
African American Studies  
Anthropology  
Art History  
Asian American Studies  
Asian Literatures and Cultures  
Asian Studies  
Business Administration  
Chemistry  
Chicano Bilingual-Bicultural Studies  
Chicano Studies  
Classical Studies  
Computer Science  
Creative Writing  
Dance  
Economics  
English  
Entomology  
Environmental Sciences  
Ethnic Studies  
French  
Geology  
Germanic Studies  
Global Climate Change  
Global Studies  
History  
International Relations  
Italian Studies  
Journalism  
Labor Studies  
Latin American Studies  
Law and Society  
Lesbian, Gay, Bisexual, Intersexual,  
and Transgender Studies  
Marxist Studies  
Mathematics  
Media and Cultural Studies  
Middle East and Islamic Studies  
Music  
Native American Studies  
Neuroscience  
Peace and Conflict Studies  
Philosophy  
Physics  
Plant Biology  
Political Science  
Psychology  
Public Policy  
Religious Studies  
Russian Studies  
Sociology  
Spanish  
Statistics (Applied)  
Theatre  
Urban Studies  
Western American Studies  
Women's Studies

# Introducing UC Riverside

<b>School Colors:</b>	Blue and Gold
<b>Classes Began:</b>	1954
<b>Campus Mascot:</b>	Highlanders/Scotty the Bear
<b>Location:</b>	Southern California, conveniently located near mountains, desert, and beaches
<b>2010 Enrollment:</b>	18,242 undergraduate; 2,504 graduate
<b>Campus Tours:</b>	TOUR@ucr.edu; My.UCR.edu
<b>UCR on the Web:</b>	www.ucr.edu

**UC Riverside** is a major research university and one of the 10 University of California campuses. A national center for the humanities, it offers students a supportive, collegial learning environment with nationally and internationally recognized faculty dedicated to the highest standards in research, teaching, and public service.

Located on nearly 1,200 acres near Box Springs Mountains in Southern California, the park-like campus provides convenient access to the vibrant and growing Inland region and to local mountains — home to some of the best skiing and snowboarding in the region — beautiful beaches, amusement parks, golf courses, and outstanding shopping and entertainment.

The university is in the city of **Riverside**, a community of approximately 300,000 people. Located east of Los Angeles and north of San Diego, Riverside is an All American City and the county administrative center. The area enjoys a year-round temperate climate and an exceptional quality of life with its architectural beauty, cultural art museums, quality housing, and wide variety of recreational opportunities. UCR is an integral part of the Riverside community through its partnership programs and the involvement of both employees and students in community activities and programs.

The nearby Ontario International Airport has daily flights to most of the nation's major cities and connecting commuter flights to the Los Angeles International Airport. Metrolink train service is available to Los Angeles.

**History** The roots of the campus date back to 1907, when the California State Legislature established the Citrus Experiment Station to conduct research on the agricultural problems of Southern California. Graduate work was conducted early in the station's history, and today, graduate education is central to its mission. The new UCR Palm Desert campus provides educational programs, research, and outreach to meet the higher education needs of the greater Coachella Valley region.



## Academic Distinctions

**College of Humanities, Arts, and Social Sciences** Home to the Gluck Fellows program, which sends talented student musicians, dancers, and actors into the community for arts outreach. The program is one of three arts outreach programs funded by the Gluck Foundation; the other two are at Julliard and UCLA. The college has the only UC undergraduate major in Creative Writing and a unique Critical Dance Studies graduate program. Visit [www.chass.ucr.edu](http://www.chass.ucr.edu).

**College of Natural and Agricultural Sciences** is a leader in the biological, physical, and agricultural sciences. The UCR Institute for Integrative Genome Biology, one of the leading institutes of genomics research in the world, brings together faculty from every academic unit on campus to participate in genomics-based discovery, providing researchers and students with access to state-of-the-art tools for advanced studies in genomics, gene expression, proteomics, microscopy, and bioinformatics. Visit [www.cnas.ucr.edu](http://www.cnas.ucr.edu).

**The Marlan and Rosemary Bourns College of Engineering** Researchers excel in study of alternative-fueled engines and vehicles, conversion of biomass to vehicle fuel, and air pollution. Majors include bioengineering; business informatics; computer science; chemical, computer, electrical, environmental, and mechanical engineering; as well as materials science and engineering. Visit [www.engr.ucr.edu](http://www.engr.ucr.edu).

**The School of Business Administration** offers the UC's oldest and most comprehensive undergraduate Business Administration major in Southern California. The School of Business Administration houses The A. Gary Anderson Graduate School of Management, which offers the Full-Time/Part-Time M.B.A. program, the Executive M.B.A. for working professionals, and the Ph.D. program in Business Administration. SoBA is home to the UCR Sloan Center for Internet Retailing, the world's leading university research center dedicated to improving the effectiveness of online retailing. Visit [www.soba.ucr.edu](http://www.soba.ucr.edu).

**Division of Biomedical Sciences** The UCR/UCLA Thomas Haider Program in Biomedical Sciences offers exclusive access to 24 medical school seats for UCR students, who complete the first two years at UCR and the last two at UCLA's David Geffen School of Medicine. The Program also supports 4 seats for the UCLA PRIME Medical School Program (a five-year dual degree program). Visit [www.biomed.ucr.edu](http://www.biomed.ucr.edu).

**Graduate School of Education** The breadth and depth of the programs offered at the GSOE is extraordinary, reflecting faculty expertise and research in such areas as autism, higher education, issues of diversity, intervention for children with reading difficulties, policy, and quantitative methods. Both professional and research degrees are offered. Visit [www.education.ucr.edu](http://www.education.ucr.edu).

The UCR campus dates from 1907, when the California State Legislature established the Citrus Experiment Station to conduct research on the agricultural problems of Southern California. Here students walk by the Campus Store.

## Principles of Community

The University of California, Riverside is committed to equitable treatment of all students, faculty, and staff. UCR's faculty, staff, and students are committed to creating an environment in which each person has the opportunity to grow and develop, and is recognized for his or her contribution.

There are three objectives that our campus must strive toward to achieve these goals.

First, we must ensure that we have an environment that nurtures the intellectual and personal growth of our students, faculty, and staff.

Second, we must ensure that our campus sets an example of respect for all people.

Third, we must ensure that our campus is a safe and welcoming environment for everyone.

We take pride in the diversity of the campus community and in ourselves by using the campus environment as a place, committed to academic integrity, where all members are encouraged to use their unique talents to enrich the daily life of the community in which they live, work, teach, and learn. Respect for differences and civil discourse must become the hallmark of how we live and work together to build our community of learners at UCR.

We as members of the University of California, Riverside affirm our responsibility and commitment to creating and fostering a respectful, cooperative, professional and courteous campus environment. Implicit in this mutual respect is the right of each of us to live, study, teach, and work free from harassment or denigration on the basis of race/ethnicity, age, religious or political preference, gender, transgender, sexual orientation, nation of origin, or physical abilities. Any violation of this right by verbal or written abuse, threats, harassment, intimidation, or violence against person or property will be considered a violation of the principles of community that are an integral part of the University of California's focus, goals, and mission (and subject to sanction according to University policies and procedures).

We recognize that we will all need to continually work together to make our campus community a place where reason and mutual respect among individuals and groups prevail in all forms of expression and interaction.

## Accreditations

**UCR** is a member of the Western Association of Schools and Colleges (WASC). The campus is fully accredited by the Senior Commission of WASC. This accreditation requires periodic review in accord with WASC policies and standards. WASC is located at 985 Atlantic Avenue, Alameda, CA 94501, (510) 748-9001.

- The B.S. degree (or equivalent program) in Chemistry is certified by the American Chemical Society as meeting its standards.
- The credential programs of the Office of Teacher Education Services are approved by the Commission on Teacher Credentialing.
- The Graduate School of Education School Psychology program is approved by the National Association of School Psychologists and the American Psychological Association.
- The B.S. degrees in chemical, computer, electrical, environmental, mechanical, and computer engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).
- The School of Business Administration and The A. Gary Anderson Graduate School of Management are accredited by AACSB International – The Association to Advance Collegiate Schools of Business.

# Resources for Learning

## ARTSblock

Executive Director: Jonathan Green

### Barbara and Art Culver Center of the Arts

3834 Main Street  
Riverside, CA 92501  
(951) 827-1467; [culvercenter.ucr.edu](http://culvercenter.ucr.edu)

The Barbara and Art Culver Center of the Arts is an interactive art facility housed in the renovated Rouse Building, a magnificent 1895 department store. The Culver Center extends the vitality and community interactivity of UCR/California Museum of Photography and Sweeney Art Gallery by providing new exhibition space; a new home for the Sweeney; an 80-seat film and video screening room; an atrium gallery for installation, music, and performance under a magnificent 35 foot high naturally illuminated clerestory monitor; a public café; a new seismically protected home for the UCR/CMP's world-treasure Keystone-Mast glass plate stereo collection, supported by a Federal Government Save America's Treasures grant; and an advanced faculty and student laboratory for advanced research in the arts.

### Sweeney Art Gallery

Director: Tyler Stallings  
3834 Main Street  
Riverside, CA 92501  
(951) 827-3755; [sweeney.ucr.edu](http://sweeney.ucr.edu)

The Sweeney Art Gallery is an artistic laboratory that engages diverse audiences with exhibitions and programs that are committed to experimentation, innovation, and the exploration of art in our time. The Sweeney places a special emphasis on inspiring projects that explore new ideas and materials and re-envision the relationship between art and life. Established on the UCR campus in 1963, the Sweeney moved to UCR ARTSblock in 2006 and plays a special role in contributing to the artistic spirit of the campus and the community at large. At the center of the gallery's mission is an appreciation for the role of artists developing the intellectual and cultural life of society.

### UCR/California Museum of Photography

3824 Main Street  
Riverside, CA 92501  
General information: (951) 784-FOTO (3686); Front desk: (951) 827-4787  
[www.cmp.ucr.edu](http://www.cmp.ucr.edu)

Founded in 1973 and located since 1990 in Riverside's downtown arts and entertainment district in an award-winning renovated dime store, UCR/CMP has grown into a major photography exhibition and study center for the West Coast. One of the most frequently visited art museum Web sites in the world, it receives more than one million "hits" each month. The Digital Studio provides a community workshop for computer-based creative expression through hands-on access to new imaging technologies. UCR/CMP is one of the facilities of the new UCR ARTSblock, an integrated arts complex consisting of three premier art institutions—the California Museum of Photography, the Sweeney Art Gallery, and the future Culver Center of the Arts (2009)—located on a single city block in downtown Riverside.

## Computing and Communications

Associate Vice Chancellor: Charles Rowley, M.B.A.  
Computing and Communications Building  
(951) 827-4741; [cnc.ucr.edu](http://cnc.ucr.edu)

Computing and Communications provides technology services and support to faculty, staff, and students.

**Application and Multimedia Development (AMD)**, (951) 827-2483; [amd.ucr.edu](http://amd.ucr.edu)  
AMD provides custom web application development that will help departments improve their business processes. AMD applications are secure, robust, and take advantage of campus infrastructure. Applications can be accessed online via most browsers using UCR's Central Authentication System. AMD also

brings cutting-edge graphic design, concept development and visualization services to the academic and administrative community through various multimedia distribution channels (e.g. 3D animations, videos, illustrations, print posters & brochures.) AMD also produces custom graphics and illustrations for grant proposals, and research publications.

**Communications Services** (951) 827-4624; [dormtel@ucr.edu](mailto:dormtel@ucr.edu)

This division provides data and voice communication needs for the campus.

**Computer Support Group (CSG)**, helpdesk (951) 827-3555; [helpdesk@ucr.edu](mailto:helpdesk@ucr.edu)

This division provides desktop computing support, including installations, troubleshooting, consulting, and assistance with acquiring and using stand-alone or networked desktop and laptop computers.

**Technology Group** (951) 827-3555; [helpdesk@ucr.edu](mailto:helpdesk@ucr.edu)

This unit is responsible for the iLearn Learning Management System (Blackboard) and provides training via workshops and support to faculty and instructors in its use. Departmental and individual consultation is available to faculty in curricular redesign and the pedagogical use of instructional technology in the classroom.

**Multimedia and Classroom Technology** (951) 827-3041; [multimedia.ucr.edu](http://multimedia.ucr.edu)

This division provides support in distance learning, classroom technology and multimedia systems to support faculty, staff, and students with their academic and nonacademic events.

**Student Technology Support** (951) 827-6495; [helpdesk@student.ucr.edu](mailto:helpdesk@student.ucr.edu);

[scs.ucr.edu](http://scs.ucr.edu) Supports campus computer labs, student e-mail, iLearn, wireless network, and VPN. Computers are available in Watkins Hall, Sproul Hall, the Statistics Computer Building, and the Arts Building.

## University Libraries

University Librarian: Ruth Jackson, Ph.D.

(951) 827-3221; [ruth.jackson@ucr.edu](mailto:ruth.jackson@ucr.edu)

Access electronic resources and hours at [library.ucr.edu](http://library.ucr.edu)

The University Libraries serves as an Information Commons and intellectual center for the campus and is the focal point for research and study at UCR. The collections include 2,630,521 print volumes, 436,109 e-books, 90,810 electronic and paper serial subscriptions, 2,322,973 microforms. The Libraries provides access to more than 386 databases; state-of-the-art information technology, including SCOTTY, the online catalog of UCR library collections; the Next Generation MELVYL pilot, the online union catalog to the collections of the UC libraries; full Web/Internet access via more than 426 PCs, 1,475 Internet ports and over 20 laptops for checkout; INFOMINE, an innovative Web index and search engine; and the California Digital Library (CDL), which provides systemwide support for access to a variety of electronic resources. These resources are made accessible through four facilities: the Tomás Rivera Library, the Raymond L. Orbach Science Library, the Multimedia Library, and the Music Library. Wireless network access is provided throughout the library. The UCR Libraries ranks among the 120 largest research libraries in the U.S. and Canada and is a member of the prestigious Association of Research Libraries, the Center for Research Libraries and the Western Region OCLC.

### Tomás Rivera Library

(951) 827-3220, [rivref@ucr.edu](mailto:rivref@ucr.edu)

The Rivera Library serves as the main library of the campus providing access to materials in the humanities, social sciences, and arts. Housing 2,050,895 volumes, 1,688,121 government publications, 2.3 million microforms, and providing access to more than 90,810 print and electronic serials, the Rivera Library also provides access to 48 study rooms, 24 graduate carrels, 203 public-use computers/scholar's workstations, and 10 laptops.

### Raymond L. Orbach Science Library

(951) 827-2821, [sciref@ucr.edu](mailto:sciref@ucr.edu)

A total of 528,064 volumes and numerous serial subscriptions support the life and physical sciences, including engineering, agriculture, and medicine. The Orbach Science Library has a seating capacity of 1,360 and provides access to 130 public-use computers/scholar's workstations, 10 laptops, and 25 group study rooms. The Map Room, with 103,248 maps and atlases, is on the ground floor. The Map Room also provides access to GIS systems and data. The Library is also the home of the U.S. Patent and Trademark Depository library and the newly acquired Water

Resources Collection and Archive, a world-class collection transferred from UC Berkeley to UC Riverside in 2010.

### Multimedia Library

2117 CHASS Interdisciplinary Building  
(951) 827-5606

A walk-in multimedia center with audiovisual equipment, media collections, and computer workstations.

### Music Library

054 Arts Building, (951) 827-3137  
Caitlin St. John, [musref@library.ucr.edu](mailto:musref@library.ucr.edu)

Contains more than 51,129 scores, 12,281 sound recordings, 7,306 compact discs, music journals, reference books, listening facilities, and computer workstations.

## User Services and Unique Collections

### Interlibrary Loan Services (ILL)/Document Delivery Services

Rivera Library ILL (951) 827-3234  
Orbach Science Library ILS (951) 827-6387

Students and faculty may use ILL to order materials from other libraries not owned by the UCR Libraries. Materials through ILL include books, periodical articles, newspapers, microforms, CDs, and videos. Articles requested are supplied via email or as a photocopy. ILL is usually free. Fee card holders, students of other academic institutions, UC alumni, Extension students, ESL students and Friends of the Library are not eligible for Interlibrary Loan services. Document Delivery Services (paging of books and journal articles located at the UCR Libraries) are provided for UCR faculty, graduate students, and staff, as well as undergraduates with disabilities. Instructions for Interlibrary Loan and Document Delivery may be found on the following webpage:

<http://library.ucr.edu/?view=services/ill>

### Research and Instructional Services

Rivera Library Reference Desk (951) 827-4392  
Orbach Science Library Reference Desk (951) 827-3316  
Music Library (951) 827-3137  
Multimedia Library (951) 827-5606  
Ask A Librarian chat (available 24/7)

[http://library.ucr.edu/?view=help/ask\\_a\\_librarian.html](http://library.ucr.edu/?view=help/ask_a_librarian.html)

Reference librarians assist in identifying and locating information and provide advisory services, including instruction in research strategies. Questions may also be sent via e-mail to the Rivera Library ([rivref@library.ucr.edu](mailto:rivref@library.ucr.edu)), the Orbach Science Library ([sciref@library.ucr.edu](mailto:sciref@library.ucr.edu)), or the Music Library ([caitlins@ucr.edu](mailto:caitlins@ucr.edu)).

### Government Publications

Main floor, Rivera Library  
(951) 827-4392

UCR Libraries serve as a selective depository for U.S. and California state government publications, with collections of government documents being held at the Rivera Library and Orbach Science Library. The government information collection contains print and digital documents from local and foreign governments and international organizations, as well as extensive law resources, census and other statistics, records of legislative bodies and judicial courts, social and economic studies, and scientific investigations. Contact Lynne Reasoner, (951) 827-5355 or [reasoner@ucr.edu](mailto:reasoner@ucr.edu).

### Patent and Trademark Depository Library

Main floor, Orbach Science Library  
(951) 827-3316

In 2007 the UCR Libraries was designated a U.S. Patent and Trademark Library. This library contains the entire backfile of U.S. utility and design patents on DVD and offers online assistance in searching the USPTO patent and trademark databases to both the general public and the UC Riverside community via the web. Contact Julie Mason, (951) 827-2817 or [jma-son@ucr.edu](mailto:jma-son@ucr.edu).

### Education and Juvenile Literature Collection

Second floor, Rivera Library  
(951) 827-3715

Contains curriculum materials, textbooks in use in local schools, and a children's literature collection to support the work of students in the Graduate School of Education's teaching credential program. Contact Christina Cicchetti, (951) 827-5138 or [cicchett@ucr.edu](mailto:cicchett@ucr.edu).

### Learning Resources Display Center

Second floor, Rivera Library  
(951) 827-3715

In 2004, the UCR Libraries was designated as a Learning Resources Display Center (LRDC) for Riverside County by the State Superintendent of Public Instruction to facilitate public review of K-8 instructional materials. Educators, parents, students, and other community members visit the center to review and make recommendations on instructional materials being considered for adoption for elementary and secondary schools. These invaluable resources are also available for review and use by the School of Education, the University community, and the general public. For questions, assistance, or to schedule a special visit to the Center, contact Christina Cicchetti, (951) 827-5138 or [cicchett@ucr.edu](mailto:cicchett@ucr.edu).

### Rupert Costo Library of the American Indian

Special Collections, Fourth floor, Rivera Library  
(951) 827-3233

Contains about 7,000 volumes and more than 9,000 documents, pamphlets, tape recordings, slides, and artwork relating to Native Americans in the United States and the world.

### Special Collections and University Archives

Fourth floor, Rivera Library  
(951) 827-3233  
Dr. Melissa Conway, [melissa.conway@ucr.edu](mailto:melissa.conway@ucr.edu)

Contains an extensive collection of rare books, manuscripts, archives, and other unique or fragile materials. Contains the Eaton Collection, the world's largest publicly accessible collection of science fiction, fantasy, horror, and utopian literature comprising over 100,000 volumes dating from the sixteenth century to the present, and circa 70,000 fanzines. It also houses other rare and archival collections in subject areas comprising agricultural, botanical, and natural sciences; ethnic studies; history of the arts; history of California and Riverside; and literary and cultural studies. Other notable collections include the Citrus Experiment Station archives, the Costo Library of the American Indian, the Sadakichi Hartmann archives, the Heinrich Schenker and Oswald Jones archive, the Tomás Rivera Archives, the B. Traven Collection, the Tuskegee Airmen Archive and a collection of antique working printing presses.

## Educational Opportunities

### California Teach-Science/Mathematics Initiative (CaTEACH-SMI)

Leslie Bushong, Director  
Resource Center, 1315 Pierce Hall  
(951)827-4970; [smi.ucr.edu](mailto:smi.ucr.edu)

California Teach-Science Mathematics Initiative (CaTEACH-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CaTEACH-SMI at UCR offers undergraduate students paid/unpaid opportunities to explore STEM teaching as a career option. Through CaTEACH-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with

academic advisors to ensure completion of STEM degree requirements. The CaTEACH-SMI Resource Center provides future STEM teachers with material and financial resources to promote planning and professional development towards a science/mathematics education career.

## Education Abroad Program

International Education Center  
University Village Suite 204  
(951) 827-4113; [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu)  
Search for programs by specific areas at <http://eap.ucop.edu>

The Education Abroad Program is UC's official study abroad program, offering a high quality curriculum tailored to meet the specific needs of UC students. EAP operates in cooperation with nearly 120 host institutions in 35 countries worldwide, and sends approximately 4,700 UC students overseas annually. Available at each class level, students in any major will want to identify an EAP experience for their degree and career plans. Options vary by duration (short term to academic year) and by academic focus. EAP details are described in the Programs and Courses section of this catalog under Education Abroad Program.

## Honorary Societies

To learn more about these organizations:

[honors.ucr.edu/opportunities/honors\\_societies.html](http://honors.ucr.edu/opportunities/honors_societies.html) or  
[www.studentlife.ucr.edu](http://www.studentlife.ucr.edu)

**Alpha Lambda Delta** is a national society that honors academic excellence during a student's first year in college. It encourages superior academic achievement among students in their first year, promotes intelligent living and a continued high standard of learning, and assists women and men in recognizing and developing meaningful goals for their roles in society. First year students with a first-year minimum 3.50 GPA are invited to join.

**Gamma Beta Phi** is a national collegiate honorary and service society that recognizes and encourages educational excellence, develops leadership and character in its members, and fosters, disseminates, and improves education through appropriate service projects. It recognizes students ranking in the top 20 percent of their class.

**Golden Key International Honour Society** The top 15 percent of undergraduate juniors and seniors (part time and full time) from all academic disciplines are invited to join Golden Key. The one-time membership fee is for life. Each year, Golden Key national and the campus chapter award scholarships to UCR members. For more information, contact the UCR Honors Program at 2316 Olmsted, (951) 827-5323.

**National Residence Hall Honorary** aids the development and maintenance of a strong, diverse and academically successful residential community within the UCR Residence Halls. Students must be in the top one percent of the residence hall population.

**National Society of Collegiate Scholars** recognizes and celebrates high achievement among first and second year students in all academic disciplines. NSCS students rank among the top 20 percent of their freshman or sophomore class.

**Omicron Delta Kappa**, the National Leadership Honor Society, was founded to recognize leadership of exceptional quality and versatility in college, including representatives in all phases of college life; that those representatives should cooperate in a worthwhile endeavor; and that outstanding students, faculty, and administrators should meet on a basis of mutual interest, understanding and helpfulness. ODK students rank in the top 35 percent of their class.

**Order of Omega** is a national honor society to recognize junior and senior members of social Greek letter organizations with a minimum 3.0 cumulative GPA for their service to the Greek system and the university. It honors the top 3 percent of the university Greek population for excellence in academics, leadership and campus or community service.

**Phi Beta Kappa** elects approximately 10 percent of seniors majoring in liberal subject areas of the arts and sciences. UCR's IOTA chapter elects on the basis of scholarly achievement, character, and broad cultural interests.

**Phi Sigma Pi National Honor Fraternity** is a co-educational fraternity open to undergraduate students that have completed 1 quarter of college coursework and achieved a minimum 3.0 GPA. Phi Sigma Pi members

participate in a lifelong journey of increased awareness, improved capabilities, great opportunities and a network of friendships while encouraging the three ideals of leadership, fellowship and scholarship.

**Pi Sigma Alpha** is the only National Political Science Honor Society for college students of political science and government in the United States. In order to be eligible, students must be a junior, senior or graduate student and be ranked in the top 1/3 of their entire class.

**Psi Chi National Honor Society in Psychology** was founded in 1929 for the purposes of encouraging, stimulating, and maintaining excellence in scholarship and advancing the science of psychology. Society members must rank in the top 35 percent of their class with a minimum 3.0 cumulative GPA.

**Sigma Alpha Lambda** promotes, recognizes, and rewards academic achievement and provides members with opportunities for community service, personal development, and lifelong professional fulfillment. Sigma Alpha Lambda is open to sophomore students (and above) with a minimum 3.0 GPA.

**Tau Beta Pi (National Engineering Honor Society)** marks those who have conferred honor upon their alma mater by distinguished scholarship and exemplary character as students, or by their attainments as alumni. Students rank in the top 1/8 of the junior class or top 1/5 of the senior class.

**Tau Sigma National Honor Society** recognizes the academic achievement of students transferring to an institution of higher learning from another academic institution, and encourages and promotes the students' involvement in the institution to which they have transferred. Tau Sigma students rank in the top 20 percent of their class with a 3.5 GPA.

## International Education Programs

International Education Programs  
UCR Extension Center  
1200 University Avenue; Riverside, CA; 92507-4596  
(951) 827-4346; fax (951) 827-1074  
[ucriep@ucx.ucr.edu](mailto:ucriep@ucx.ucr.edu); [www.iep.ucr.edu](http://www.iep.ucr.edu)

Offers a wide variety of English language, Certificate and Diploma programs for international students and professionals on a year-round basis. Also offers academic pathways for students wishing to study at UCR and other U.S. colleges and universities, and opportunities for visiting international students to take UCR credit courses, on a space available basis. Provides support services such as program orientation, housing assistance, immigration advising, social activities, and counseling.

Offers the following programs:

- Intensive English
- Improving Oral Fluency
- Conversation and American Culture
- English for International Business
- English for Academic Purposes
- University Credit Program
- UCR Admission Preparation Program
- UCR International Transfer Track Program
- Teaching English to Speakers of Other Languages (TESOL)
- Several intensive professional programs including postgraduate diplomas in management and hospitality.

## Reserve Officer's Training Corps

Students may with the permission of the dean of their college enroll in ROTC courses at another institution while completing their degree programs at UCR. Students interested in Air Force ROTC should contact the Office of Undergraduate Admissions at (951) 827-3411 regarding concurrent enrollment procedures. Those interested in Army ROTC should contact the Office of the Registrar at (951) 827-3409 for information on cross-registration. Descriptive pamphlets summarizing the programs are available at the UCR Career Center.

**Air Force Reserve Officer Training Corps (AFROTC)** prepares young men and women to become second lieutenants in the United States Air Force while completing their college degree. The program offers scholarships, internships, and a rewarding career after graduation. Classes are offered at California State University, San Bernardino; however, UCR students may enroll using our cross-town agreement. For more

information, please contact (909) 537-5440 or visit <http://afrotc.csusb.edu>.

**Army ROTC** Through arrangements with Claremont McKenna College and the Department of Military Science at California State University, San Bernardino, two- and four-year Army ROTC (AROTC) programs are available. Academic units earned in the program may be counted as elective units toward fulfillment of UCR graduation requirements. Successful completion of the AROTC program leads to a commission as a Second Lieutenant with subsequent service on active duty or assignment to an Army Reserve or National Guard unit. For more information call Claremont McKenna College, (909) 537-5533 or 537-5534 or visit [www.cmcarmyrotc.com](http://www.cmcarmyrotc.com).

## Summer Sessions and Special Programs

361 Surge Building  
(951) 827-3044; <http://summer.ucr.edu>

Summer Sessions offers regular UCR courses in multiple, abbreviated summer sessions, giving students the opportunity to expedite time to graduation, take hard-to-get classes, improve their GPA, get back on academic track, perform research with faculty, and seek professional development or enrichment courses.

**Who May Attend?** Summer term is open to all UC and non-UC students with a high school degree, or who are at least 18 years of age. Students do not have to be admitted to the university to attend Summer Sessions, nor does admission to Summer Sessions constitute admission as a regular student of the university. See the website for more information and an application form for non-UCR students: <http://summer.ucr.edu>.

Special Programs, such as the Summer Study Abroad, offer summer students 8 units of credit while participating in a UCR faculty-led program in an international setting (<http://summerstudyabroad.ucr.edu>). Similarly, the Summer Academy for Advanced High School Students program takes advantage of the compressed session format to open the UCR campus to eligible high school students. The program gives high school students an opportunity to get a head start on their undergraduate degree by earning lower division course credit on an official UC transcript: (<http://summeracademy.ucr.edu>).

**Credits, Grades, and Units** All UCR courses are normally transferable to other institutions and applicable to degree programs. For UCR students, credits and grades are automatically placed on their official transcript of record without any necessity to transfer them. UCR continuing students wishing to take courses in excess of 10 units per session must have the approval of their college dean; all other students must have the permission of the Summer Sessions Director of Administration. UCR students in dismissed status must seek approval from their college dean before registering for Summer Sessions.

## University of California Center Sacramento Scholar Intern Program

Associate Director and Public Affairs Journalism Director: AG Block  
1130 K Street, Suite LL22  
Sacramento, CA 95814  
(916) 445-5100 or (951) 827-2634  
[uccs.universityofcalifornia.edu](http://uccs.universityofcalifornia.edu)

The UCCS program provides students with an opportunity to gain first-hand knowledge of California's public policy challenges and processes. The program includes coursework as well as professional experience while living, interning, and attending classes in Sacramento. Participants will

- Work as an intern supporting the policy making process in a legislator's office, an executive branch agency, or another setting in the Sacramento policy community. (10 credit hours)
- Learn about the state's political processes, institutions, and policy challenges in the California Policy Seminar taught by members of the UC Davis faculty and featuring guest lectures given by a wide array of participants in and observers of California politics and government. (4 credit hours)

- Take courses on the UC Davis campus as appropriate to individual needs and interests. (optional)

Housing is available for students 10 minutes from the Capitol building and internships range from 24 to 33 hours per week. Application requirements include a 3.0 recommended GPA and junior, senior, or graduate standing during the participating quarter. Financial aid is available for the quarter in Sacramento.

## UC Riverside Extension

Dean: Sharon A. Duffy, Ph.D  
1200 University Avenue; Riverside, CA; 92507-4596  
(951) 827-4105; fax (951) 827-7374  
[moreinfo@ucx.ucr.edu](mailto:moreinfo@ucx.ucr.edu); <http://www.extension.ucr.edu>

UCR Extension is the continuing education branch of the university. Extension programs are open to anyone seeking higher education. University Extension offers degree credit; postgraduate continuing education credit; and noncredit programs for pursuit of intellectual and cultural interests, professional and career advancement, and examination of topical thinking on public affairs and urban problems. Current and former undergraduate students can enhance their degrees through one of the specialized Professional Certificate Programs. Many courses are offered weekends and evenings for students' convenience.

UCR Extension provides a range of educational opportunities and formats, including concurrent enrollment in UCR campus courses, weekend and one-day conferences, intensive and online Certificate Programs. Intensive English and other programs for non-matriculated international students and international groups are available throughout the year. Students do not need to be admitted to a degree program at UCR to enroll in Extension's courses or programs.

**Degree Credit** Credit earned in certain Extension courses may be applicable to degree requirements at the time of admission to the university. (See University of California Extension Courses in the Programs and Courses section.) Students should check with the Office of Undergraduate Admissions about the applicability of such credit. Resident students in the university wishing to apply Extension credit to degree requirements must have advance approval from the dean of their college or division before enrolling in Extension courses.

## UC Riverside Palm Desert Graduate Center

Chief Operating Officer: Tamara Hedges  
75-080 Frank Sinatra Drive  
Palm Desert, CA 92211  
(760)834-0800; fax (760) 834-0796  
[tamara.hedges@ucr.edu](mailto:tamara.hedges@ucr.edu); [www.palmdesert.ucr.edu](http://www.palmdesert.ucr.edu)

The UCR Palm Desert Graduate Center expands the reach of University of California, Riverside into one of the fastest growing regions of California. Established as a teaching and research center in 2005, the UCR Palm Desert Graduate Center is a catalyst for diversification of the inland desert region by providing relevant regional research, offering innovative graduate programs that attract and retain world class talent to the region, convening and creating partnerships that advance the public good, and impacting the cultural life of the community.

## UC Riverside Washington Academic Internship Program

UCR Director: Thomas M. Perring, Ph.D.  
UCR Coordinators: Trina Elerts (campus) and Chantal Quintero (DC)  
Undergraduate Education  
2319 Olmsted Hall  
[www.ucdc.ucr.edu](http://www.ucdc.ucr.edu)

This program provides undergraduate students with a multi-dimensional education experience in Washington, DC. Students undertake academic pursuits as well as cultural and social activities. The program combines course work with field research and internship experience. Students also have the opportunity to tour local sites and dialogue with distinguished professionals in the Speaker Series.

Students from all majors can benefit from the program. Visit [www.ucdc.ucr.edu](http://www.ucdc.ucr.edu) for information about internships and links to other job search sites. The UC Washington Center is located in downtown Washington, DC, six blocks from the White House. The UC Washington Center is an innovative teaching and research facility shared by all of the UC campuses that has classrooms, faculty and staff offices, a modern computer lab, and a student lounge, as well as living facilities for all participants in the program.

**Academic Program** Students may enroll in 12 to 16 units of course credit for the quarter.

**Internship** (4-8 units) The focal point of the academic program is the internship, which is based on the students' interests and major, and is arranged before the student leaves for Washington, D.C. May be letter graded or S/NC depending on discipline. Visit [www.ucdc.ucr.edu](http://www.ucdc.ucr.edu) for sample internships.

**Seminar in Washington D.C.** (4 units) UCR students meet once per week with a faculty member in residence at the UCDC Center. Academic assignments focus on understanding the city of Washington, D.C., its history, politics and culture. Offered for a letter grade.

**Interdisciplinary Elective** (4 units) Serves as a weekly forum for students to share and enhance their knowledge of living and working in Washington, D.C. Students will read about, experience and analyze key sites in a multi-disciplinary context. May be letter graded or S/NC.

**Academic Planning/How to Apply** Interested students should consult well in advance with their academic advisors and the UCDC program staff to determine how participation in the program will affect their degree progress. Consult [www.ucdc.ucr.edu](http://www.ucdc.ucr.edu) for application deadlines and information on how to apply.

**Eligibility and Selection** Minimum requirements are a 3.0 cumulative GPA and junior or senior standing during the participating quarter. In addition to academic criteria, the selection committee considers the student's seriousness of purpose, maturity and the capacity to adapt to a study-quarter away.

**Financial Matters** Program participants pay the same UC and campus fees as a quarter at UCR and are responsible for room and board, books, and personal expenses. The only additional cost directly related to the program is round-trip transportation.

Many forms of financial assistance are available to participants. Students who receive state and federal financial aid may use their scholarships, grants and loans to finance their quarter at UCDC. Students who receive financial aid may also be eligible for funds from the President's Washington Scholarship. Other support may also be available; students should consult with the UCDC program staff or the financial aid office for more information.

## University Honors Program

2316 Olmsted Hall  
(951) 827-5323; fax (951) 827-5320  
[honors@ucr.edu](mailto:honors@ucr.edu); [honors.ucr.edu](http://honors.ucr.edu)

Excellent students in all undergraduate programs can participate in University Honors. The lower-division curriculum emphasizes special seminars, projects, and classes designed to introduce honors students to the rewards of scholarship and research. The upper-division curriculum provides the student with the framework to produce a thesis or project under the supervision of a faculty mentor.

- Freshmen are admitted to University Honors on the basis of high school academic and extracurricular records.
- Sophomores can apply for admission to the second year of University Honors if their cumulative GPA is 3.50 or above.
- Juniors, seniors and transfer students with an interest in undergraduate research or creative activity, and GPAs of 3.50 or above may apply in their third or fourth year.

University Honors offers a variety of extracurricular enhancements, including a reading room and work space with computer facilities. Participant benefits include priority registration and transcript notation. Honors students are above-average, self-directed individuals who seek challenges and consistently strive to achieve excellence. Come join our learning community!

## Research Opportunities

Students at UC Riverside have a distinct advantage in the multitude of opportunities available for participating in faculty research programs. Independent participation in such research helps students develop technical skills, explore areas of modern research, and learn how the "real world" of research operates. In addition, working with a faculty member gives students the opportunity to interact closely with professors, who, in turn, get to know the students.

To participate in undergraduate research opportunities on campus, students can

- Check out the college and multicampus research opportunities listed below and visit [www.ucr.edu/research.html](http://www.ucr.edu/research.html) for other opportunities
- Examine the online research opportunities for the College of Natural and Agricultural Sciences at <http://cnasstudent.ucr.edu/> and the Bourns College of Engineering at [www.engr.ucr.edu/urop](http://www.engr.ucr.edu/urop).
- Examine research-specific Web sites posted by colleges and departments
- Contact departmental advisors directly
- See the Internship Program under Career Center in the Services for Students section in this catalog

## College of Humanities, Arts, and Social Sciences

### California Center for Native Nations

Director: Michelle Raheja, Ph.D.,  
2006 Humanities and Social Sciences Building  
(951) 827-1799

[michelle.raheja@ucr.edu](mailto:michelle.raheja@ucr.edu); [ccnn.ucr.edu](http://ccnn.ucr.edu)

Provides opportunities for research collaborations with California's native peoples and other Indian tribes that benefit tribal communities and expand scholarly knowledge. As UCR is a neighbor to more than 30 tribes in the surrounding area, the center particularly supports interdisciplinary and culturally sensitive research in collaboration with these communities.

### Center for Bibliographical Studies

Director: Henry L. Snyder, Ph.D.  
B115 Highlander Hall  
(951) 827-5841; fax (951) 827-4120  
[www.cbsr.ucr.edu](http://www.cbsr.ucr.edu)

Supports research and publication in bibliographies and the history of the book. It manages three internationally renowned programs.

- The English Short Title Catalog (ESTC) records every item within its scope: published in Great Britain and any British governed territories from the beginning of printing (1473) through the end of the eighteenth century. The catalog is now searchable free of cost via the British Library website.
- The California Newspaper Project (CNP) records surviving issues of all newspapers published in California, freely available for searching at the above website.
- The California Newspaper Microfilm Archive (CNMA) preserves and stores filmed California Newspapers as archival quality master negatives. Duplications can be requested at the above website.
- The California Digital Newspaper Collection (CDNC) is a text-searchable collection of select digitized California newspapers from 1848 to 1910 and is accessible free through the Center's website.
- *Un Catálogo Colectivo de Impresos Latinoamericanos hasta 1851* (CCILA) is a comprehensive union catalog of Latin American imprints through 1850, with 40,000 records searchable through the above Web site.

## Center for Family Studies

Director: Nancy Guerra, Ph.D.  
Olmsted Hall, Third Floor  
951 827-6421;  
[Nancy.guerra@ucr.edu](mailto:Nancy.guerra@ucr.edu); [chass.ucr.edu/centers/cfs](http://chass.ucr.edu/centers/cfs)

Focuses on significant advances in family theory, research, and application requiring an interdisciplinary perspective and intra- and cross-cultural approaches to family issues. Represents anthropology, education, history, sociology, and psychology.

## Center for Ideas and Society

Director: Georgia Warnke, Ph.D., Distinguished Professor of Political Science, Associate Dean, College of Humanities, Arts, and Social Sciences

Assistant Director: Laura Lozon  
2026 CHASS INT North  
(951) 827-IDEA (4332); fax (951) 827-6377;  
[www.ideasandsociety.ucr.edu](http://www.ideasandsociety.ucr.edu), [laura.lozon@ucr.edu](mailto:laura.lozon@ucr.edu)

Promotes collaborative humanistic research at UCR as well as nationally and internationally. The focus is on fostering inquiry from multiple perspectives and furthering more robust and nuanced understandings of topics than is sometime possible within traditional disciplines. The center offers fellowships for UCR faculty and supports conferences, lectures, and performances.

## Institute for Research on World-Systems

Director: Christopher Chase-Dunn, Ph.D.  
College Building South  
(951) 827-2062;  
[chriscd@ucr.edu](mailto:chriscd@ucr.edu); [irows.ucr.edu](http://irows.ucr.edu)

Organizes collaborative research among social, biological, and physical scientists on long-term, large-scale social change and its ecological, geographical and climatological causes and effects. Research foci include globalization; global inequalities; transnational social movements; urbanization and settlement systems; biotechnology and hegemony; the rise and fall of cities, states, and empires; and climate change.

## Robert Presley Center of Crime and Justice Studies

Co-directors: Robert Nash Parker, Ph.D. and Kirk Williams, Ph.D.  
2159 College Building South  
(951) 827-4604;  
[www.stopyouthviolence.ucr.edu](http://www.stopyouthviolence.ucr.edu)  
[www.presleycrimeandjusticecenter.ucr.edu/](http://www.presleycrimeandjusticecenter.ucr.edu/)

Generates knowledge to form and implement effective crime prevention and control policies. The center encourages and facilitates research in the social sciences on basic and policy-related questions regarding justice, legal concepts and processes, social deviance and control, and research strategies for addressing such questions.

## College of Natural and Agricultural Sciences

### Air Pollution Research Center

Director: Paul Ziemann, Ph.D.  
[paul.ziemann.ucr.edu](http://paul.ziemann.ucr.edu); [aprc.ucr.edu/aprc.html](http://aprc.ucr.edu/aprc.html)

Conducts fundamental and applied research in atmospheric science, including physical and chemical removal and transformation processes of biogenic and anthropogenic emissions, and effects on vegetation of chemicals and particles emitted by or formed in the atmosphere.

### Botanic Gardens

Director: J. Giles Waines, Ph.D.  
(951) 784-6962; (951) 827-4650;  
[gardens.ucr.edu](http://gardens.ucr.edu)

Consists of more than 40 acres of gardens along the eastern boundary of the campus. The landscaped areas around campus buildings demonstrate the use of a wide assortment of plants that grow well in the inland area of Southern California. Established for teaching purposes, the gardens

provide plant materials for anthropology, art, biology, botany, conservation, ecology, entomology, morphology, ornamental horticulture, plant pathology, photography, and taxonomy. They also provide plant materials for research projects and for the testing and exhibition of plant species introduced from all parts of the world.

## Center for Conservation Biology

Director: Michael Allen, Ph.D.  
[michael.allen@ucr.edu](mailto:michael.allen@ucr.edu); [ccb.ucr.edu](http://ccb.ucr.edu)

Assists in the conservation and restoration of species and ecosystems by facilitating the collection, evaluation, and dissemination of scientific information. The center identifies new and existing research priorities in conservation biology and inaugurates new research programs. Many activities of the center are regional, centered on the diverse species and habitats that form the natural heritage of Southern California.

## Center for Invasive Species Research

Director: Mark Hoddle, Ph.D.  
(951) 827-4714;  
[mark.hoddle@ucr.edu](mailto:mark.hoddle@ucr.edu); [cirs.ucr.edu](http://cirs.ucr.edu)

Entomologists, botanists, biologists, nematologists, and plant pathologists from UCR head up collaborative efforts with other UC scientists as well as with state and federal government researchers to define and implement critical research on pests introduced into California that present risks to public health, urban environmental quality, natural resources, managed and unmanaged ecosystems, and economically important plants.

## Institute for Integrative Genome Biology

Director: Natasha Raikhel, Ph.D.  
Noel T. Keen Hall  
[genomics.ucr.edu](http://genomics.ucr.edu)

Supports faculty in diverse disciplines participating in genomics-related research, which has enormous potential for applications to improve human health, agricultural sustainability, and the environment. Contains advanced technology in DNA sequencing, microarray making and analysis, visual microscopy, bioinformatics, and proteomics. Encompasses the following three centers.

## Center for Disease Vector Research

Director: Peter Atkinson, Ph.D.  
[peter.atkinson@ucr.edu](mailto:peter.atkinson@ucr.edu); [cdvr.ucr.edu](http://cdvr.ucr.edu)

The center includes scientists studying vector-pathogen systems at the molecular, genetic, and ecological levels, with work applicable to human health, as well as the well-being of domestic animals and the protection of crop plants. The center strives to adopt a comprehensive approach to the problem of vector-transmitted pathogens at both basic and applied research levels.

## Center for Plant Cell Biology

Director: Natasha Raikhel, Ph.D.  
[natasha.raikhel@ucr.edu](mailto:natasha.raikhel@ucr.edu); [cepceb.ucr.edu](http://cepceb.ucr.edu)

An interdisciplinary research center uniting plant cell and molecular biologists with computational scientists, engineers, bioengineers, chemists, and nanoscientists in plant systems-based research, using new computational biology, engineering and chemical genomics approaches to understand processes regulated at the molecular and cellular level in the context of the whole organism. The research has applications for agriculture and human biology.

## Statistical Consulting Collaboratory

Director: Daniel Jeske, Ph.D.  
2680 Statistics/Computer Building  
(951) 827-3014;  
[collaboratory.ucr.edu](http://collaboratory.ucr.edu), [daniel.jeske@ucr.edu](mailto:daniel.jeske@ucr.edu)

Provides statistical consulting services in areas including bioinformatics, agricultural field trials, ecological studies, entomological studies, sociological studies, marketing studies, industrial experiments, quality and reliability

studies, and product and process development studies. Clients include the campus research community and off-campus agencies from all disciplines who use statistics. The collaboratory also develops collaborative research relationships as well as research publications. It also provides financial support and consulting experiences to UCR undergraduate and graduate students.

### **Stem Cell Center**

Director: Prudence Talbot, Ph.D.

(951) 827-5689;

[stemcells@ucr.edu](mailto:stemcells@ucr.edu); [stemcells.ucr.edu](http://stemcells.ucr.edu)

Focuses on understanding the basic mechanisms that control stem cell function and deciphering how the tremendous potential of stem cells can be used to improve human health. Researchers at the Center have expertise in many different fields including developmental biology, cancer biology, endocrinology, aging, nanotechnology, neuroscience and bioengineering.

### **USDA-ARS U.S. Salinity Laboratory**

Director: Donald Suarez, Ph.D.

450 West Big Springs Road

Riverside, CA 92507

(951) 369-4814;

[www.ars.usda.gov/main/site\\_main.htm?modecode=53102000](http://www.ars.usda.gov/main/site_main.htm?modecode=53102000)

The only research facility in the nation devoted to the study and amelioration of salinity-related agricultural and environmental problems.

### **Water Science and Policy Center**

Director: Ariel Dinar, Ph.D.

(951) 827-2875;

[ariel.dinar@ucr.edu](mailto:ariel.dinar@ucr.edu); [wspc.ucr.edu](http://wspc.ucr.edu)

Increasing water scarcity in the face of competing demands by urban, industrial, agricultural, and environmental sectors will necessitate innovative scientific, technological, and institutional solutions. The Water Science and Policy Center is developing focused water-science research and teaching programs that expand our knowledge base while simultaneously helping stakeholders to solve critical water management problems.

## **The Marlan and Rosemary Bourns College of Engineering**

### **Center for Bioengineering Research**

Director: Jerome S. Schultz, Ph.D.

A220 Bourns Hall

(951) 827-2111; fax (951) 827-6416;

[www.engr.ucr.edu/CBR.html](http://www.engr.ucr.edu/CBR.html)

The Center for Bioengineering Research partners the Department of Bioengineering faculty with other UC Riverside engineering and science departments. Focal areas include cellular control and regulation, biophotonics and medical laser applications, *in-silico* biosystems and biomolecular modeling, bio-nanotechnology, microfluidics for bioanalyses, rational drug design and high throughput screening.

### **College of Engineering—Center for Environmental Research and Technology (CE-CERT)**

Director: Matthew Barth, Ph.D.

1084 Columbia Avenue

Riverside, CA 92507

(951) 781-5791; fax (951) 781-5790

[info@cert.ucr.edu](mailto:info@cert.ucr.edu); [www.cert.ucr.edu](http://www.cert.ucr.edu)

A model for partnerships among industry, government, and the academic community, CE-CERT is one of California's premier facilities for research into air quality, transportation, and energy efficiency. The research mission includes transportation systems, emissions and fuels, renewable energy, environmental modeling and policy, and atmospheric processes.

### **Center for Nanoscale Science and Engineering (CNSE)**

Director: Robert C. Haddon, Ph.D.

[robert.haddon@ucr.edu](mailto:robert.haddon@ucr.edu); [www.cnse.ucr.edu](http://www.cnse.ucr.edu)

Engineers, physicists, computer scientists, neuroscientists, biologists,

chemists, and biomedical scientists explore nanoscale materials, such as organic compounds, carbon nanotubes, and magnetic materials, for use in nanoelectronics, spintronics, sensors, and biomedical devices to develop new or improved technologies. The center is jointly funded and administered by the Bourns College of Engineering and the College of Natural and Agricultural Sciences.

### **Center for Research in Intelligent Systems (CRIS)**

Director: Bir Bhanu, Ph.D.

Engineering II, Room 216

(951) 827-3954; fax (951) 827-2425;

[www.cris.ucr.edu](http://www.cris.ucr.edu)

Promotes interdisciplinary research for developing computer systems that are flexible, adaptive, and intelligent. Involves an interdisciplinary team of faculty from Electrical Engineering, Computer Science, Psychology, Economics, Statistics, Mathematics, and Management. The goal is the research and development of autonomous/semiautonomous systems with sensing capabilities that can communicate and interact with other intelligent (biological and artificial) systems.

## **Other UC Riverside Research**

### **Edward J. Blakely Center for Sustainable Suburban Development**

Interim Director: David Swanson, Ph.D.

(951) 827-7830;

[cssd.ucr.edu](http://cssd.ucr.edu)

Explores the social, economic, political and ecological questions posed by the expansion of human settlement into the suburbs, using its neighboring communities as a laboratory while recognizing that these are global issues. Involves collaborations among faculty and researchers in the social sciences, the natural and mathematical sciences, the professions, and the arts and humanities.

## **Multicampus Research**

### **Agricultural Experiment Station — Citrus Research Center**

[cnas.ucr.edu/faculty/ca\\_aes.html](http://cnas.ucr.edu/faculty/ca_aes.html)

A branch of the University of California's statewide Agricultural Experiment Station, the nation's largest land-grant experiment station and the research arm of the University of California's Division of Agricultural and Natural Resources, headquartered in Oakland. Conducts research in plant, pest and disease, and natural resource sciences and, through Cooperative Extension, provides leadership in the dissemination and application of research-based knowledge in agricultural and environmental science to the people of California. Through educational programs and research opportunities, prepares tomorrow's leaders in agricultural and environmental science.

### **Cooperative Extension**

[cnas.ucr.edu/faculty/cooperative\\_extension.html](http://cnas.ucr.edu/faculty/cooperative_extension.html)

Cooperative Extension specialists headquartered at UCR oversee research programs that provide technologies and scientific information to aid the region's residents and help coordinate the activities of farm and family and consumer services advisors based in more than 50 county offices. Programs include sustainable agriculture, pest management, consumer sciences and marketing, irrigation, water quality, urban horticulture, and natural resources management.

### **Natural Reserve System**

[www.biology.ucr.edu/about\\_us/nrs.html](http://www.biology.ucr.edu/about_us/nrs.html)

The University of California Natural Reserve System has established and maintains for teaching and research a system of reserves encompassing the diversity of California's natural terrain, both aquatic and terrestrial. Any qualified individual or institution may use the reserve system under the direction and with the approval of the university. UCR administers 8 of the approximately 35 reserves systemwide.

**Philip L. Boyd Deep Canyon Desert Research Center** encompasses 6,122 acres of desert habitat around Deep Canyon, near Palm Desert. An air-conditioned field station with living quarters and laboratories is located near the mouth of Deep Canyon. A primitive campground and two-square-mile teaching area is available for class use.

**James San Jacinto Mountains Reserve** near Idyllwild is approximately 30 acres, surrounded on all sides by relatively undisturbed national forest land. Nearby there are sixty miles of hiking trails with access to thousands of acres of mid- and high-elevation wilderness, from nearby Lake Fulmor to the summit of Black Mountain, at 7,800 feet. The reserve is equipped for field classes of up to 30 students and has indoor housing for small groups.

**Oasis de los Osos Reserve** is located near Snow Creek at the northern base of Mount San Jacinto. This property consists of 160 acres of rocky desert slopes and a dry alluvial fan. It also contains a perennial stream (Lamb Creek) with some waterfalls. A riparian woodland grows along this stream. A semi-desert scrub plant community occurs on the dry slopes and alluvial fan and along the washes. No facilities are available at this site.

**Box Springs Reserve** consists of 160 acres near the top of Box Springs Mountains. The property includes both coastal sage scrub and chaparral habitats. No laboratory facilities are present on the property, because of the proximity of such facilities on the UCR campus. This reserve has been used for field class laboratories and student research projects, but other research projects can be conducted at this site.

**Sacramento Mountains Reserve** contains approximately 590 acres of desert habitat in the Mojave Desert. It is located about 18 miles west of Needles along Interstate Highway 40. This property contains at least seven species of cacti, including one of the best displays of Bigelow Cholla (*Opuntia bigelovii*) in California. No laboratory facilities or living quarters are on this site, but a campsite is available for anyone wishing to use the reserve overnight for teaching or research.

**Motte Rimrock Reserve** consists of approximately 715 acres at the northwestern corner of Perris, about 15 miles from campus. The vegetation is principally coastal sage scrub and grassland with riparian corridors in the canyons. This land is of particular biological interest for this region because it contains several species of conservation interest. Indian pictographs and a former Indian village site also are on this reserve. A headquarters building contains sleeping facilities and a small laboratory for reserve users.

**Emerson Oaks Reserve** is located 5 miles east of Temecula and 1 mile south of Highway 79. This 255-acre site contains coastal sage scrub on the lower hills, chaparral on the upper slopes, and oak woodland (primarily coast live oak) in the valley portion. More than 20 acres of oaks also occur on one of the hillsides. Several permanent springs are on the property. Vegetation at the site is currently recovering from a wildfire in 2004. A newly renovated laboratory facility is available.

**Jack and Marilyn Sweeney Granite Mountains Desert Research Center** contains approximately 9,000 acres embedded in the 1.6 million-acre Mojave Desert National Preserve in eastern San Bernardino County. This rugged and scenic site offers exceptional local and regional biotic diversity, ranging from low Mojave Desert flora and fauna to remnant Colorado Plateau biota on the highest peaks. A campground and a small building at Norris Camp are available for class use, and the Allanson complex includes a state-of-the-art research laboratory, conference room, and lodging for up to 15 researchers.

## UC Institute for Mexico and the United States (UC MEXUS)

Director: Exequiel Ezcurra, Ph.D.  
3324 Olmsted Hall  
(951) 827-3519; fax (951) 827-3856;  
[ucmexus@ucr.edu](mailto:ucmexus@ucr.edu); [ucmexus.ucr.edu](http://ucmexus.ucr.edu)

Identifies UC system resources related to research, education, creative activity, and public service involving Mexico and people of Mexican origin. Develops a coordinated, systemwide approach to Mexico-related studies.

# Services for Students

## Academic Resource Center

Director: Michael Paul Wong, M.Ed., Ph.D.  
Surge Building, First Floor  
(951) 827-3721; [www.arc.ucr.edu](http://www.arc.ucr.edu)

The Academic Resource Center (ARC) provides academic support to all enrolled undergraduate and graduate students at UCR. Each quarter it offers various programs and services to help students succeed and excel academically. Programs and services are offered 9:00 a.m. – 8:00 p.m. (Monday – Thursday), 9:00 a.m. – 5:00 p.m. (Friday), and evening hours at the ARC and throughout the day in various locations throughout campus, including the following:

**Academic Intervention/Peer Counseling** Provides customized support to students who are encountering academic difficulty, and helps students to make a successful transition to university life.

**Computer Lab** State-of-the-art 29 station computer lab is open to all enrolled students for academic purposes.

**Early Warning Program** For certain targeted classes, this program assists struggling students, as identified by low scores on an early assignment or test, with special workshops and individual meetings with trained undergraduate Peer Educators.

**Graduate Prep Seminars** The ARC offers low-cost seminars to help students prepare for exams required by graduate schools and professional schools: the GRE exam (for graduate programs) and the MCAT exam (for medical schools). The MCAT Seminar is an intensive two-quarter class that meets twice a week during the Winter and Spring Quarters, including a Saturday pretest and posttest, and focuses on critical reading and writing skills. Seminars are available only for full-time registered UCR students. Seminars are canceled if there are insufficient numbers of interested students.

**Intermediate Algebra Workshops (LNCR 035)** The ARC provides this remedial math course, developed with the Math Department, for admitted UCR students who have placed into Community College Math but nevertheless need to qualify to take more advanced math classes to complete their academic degree objectives.

**Mathematics Advisory Examinations** For incoming students, placement examinations are used by UCR to assess student readiness for University work and to determine the appropriate course placement in Mathematics.

**SAP (Satisfactory Academic Progress)** In collaboration with the Financial Aid Office, assists referred students with individual counseling and refers them to campus resources and general information on university and financial aid regulations.

**Success Central** Provides workshops and programs to assist students in developing strategies and locating resources that will promote academic success, such as time management, study skills and test preparation. Facilitated by professional staff, offers preparatory courses for graduate and professional school standardized examinations, such as GRE, LSAT, and MCAT.

**Summer Bridge Program** Provides assistance and coursework in precalculus or writing composition for entering students in preparation for the first year of college.

**Supplemental Instruction (SI)** Provides regular meetings, facilitated by upper division students, to help students to practice and develop academic skills necessary for success in targeted high priority courses. Helps students to develop strategies to improve performance in coursework offered in both lower and upper division courses such as Biology, Chemistry, Economics, Mathematics, Organic Chemistry, and Physics

**Student Employment** The ARC offers employment and leadership development opportunities for undergraduate students as peer educators, Supplemental Instruction leaders, lab leaders, tutors, peer counselors, peer educators, math advisory exam proctors, administrative support assistants, and computer lab monitors. The Summer Bridge program also offers TA positions for graduate students.

**Tutorial Assistance Program (TAP)** is provided on a walk-in, group basis and no advanced appointments are necessary. Students should view the quarterly drop-in tutoring schedule for specific days and times. Drop-in tutoring is best for quick questions and answers and group study. Drop-in tutoring is available for many high demand undergraduate subjects.

## Associated Students (ASUCR) (Undergraduate Student Government)

202 Highlander Union Building (HUB)  
(951) 827-3621; [asucr.ucr.edu](http://asucr.ucr.edu)

ASUCR is a 20-member student senate representing all undergraduate students, with members elected by students from each of the three colleges: Engineering, 2; Natural and Agricultural Sciences, 5; and Humanities, Arts, and Social Sciences, 13. The senate chooses from its own members a President, a Chairperson, a Vice President of External Affairs, and a Vice President of Campus Internal Affairs. Additionally, the senate fills five positions from the general student body: a Vice Chair, a Vice President of Finance, a Personnel Chair, an Outreach Director, and an Elections Chair. Together, these officers make up the cabinet, which is the decision-making body when senate is not in session.

ASUCR is supported by the ASUCR fee, \$12.50 per quarter: \$2.00 funds clubs and organizations; and \$10.50 funds student-owned and -operated businesses and student advocacy efforts, and the operating costs of ASUCR. ASUCR is a member of the UC Student Association (UCSA) for systemwide and statewide representation and of the United States Student Association (USSA) for national representation. It appoints undergraduates to several important committees that play a role in campus governance, including the Highlander Union Board of Governors, the Recreation Facility Board of Governors, the Registration Fee Advisory Committee, Student Conduct, and the Parking Committee.

**The Exchange** is ASUCR's student-owned and -operated business, 105 Highlander Union Building (HUB), (951) 827-2689. It offers discounted tickets to major southern California theatre chains and amusement parks and sells balloon bouquets, class rings, graduation announcements, diploma frames, greeting cards, school supplies, and Greek (sorority and fraternity) items. Also available is a digital picture maker, and mailing and faxing services.

## Associated Students Program Board

111 Highlander Union Building (HUB)  
(951) 827-ASPB (2772); fax (951) 827-2144  
[www.aspb.ucr.edu](http://www.aspb.ucr.edu); [aspb@ucr.edu](mailto:aspb@ucr.edu)

The Associate Student Programming Board is student-run and plays a critical role in providing student programming and entertainment for UCR's campus community. From annual events such as Highlander Welcome, Block Party, the Wednesday Nooner Series, Homecoming, and Spring Splash, to special programs such as comedy shows, spoken word, concerts, and the latest movie releases.

## Assistant Vice Chancellor and Dean of Students

Dean: Susan Allen Ortega, Ed.D.  
Assistant Dean: Alfredo Figueroa, B.A.  
Assistant Dean: Tonantzin Oseguera, M.Ed.  
381 Highlander Union Building (HUB)  
(951) 827-6095; [deanofstudents.ucr.edu](http://deanofstudents.ucr.edu)

The office of the Assistant Vice Chancellor and Dean of Students works with the vice chancellor and assistant vice chancellors for student affairs in advancing the university's educational mission. The office provides advocacy and support for students, serves as a point person for communication with parents, works with faculty and administration to create a climate that promotes personal and intellectual development and encourage the full participation of all students and community among students.

## Athletics and Recreation

### Recreation Programs/Student Recreation Center

Director: Lindy Fenex, Ph.D.  
Student Recreation Center  
Linden Street (northwest side of campus)  
(951) 827-5738; [www.recreation.ucr.edu](http://www.recreation.ucr.edu)

UCR offers students, staff, and faculty a state-of-the-art facility for exercise, sports activities, and general recreational use. The 80,000-square-foot facility includes a fitness center with a weight room; a large cardiovascular training area containing exercise bikes, treadmills, elliptical trainers, and stair climbers; and four racquetball courts and one squash court. It also offers personal training for members. Three large multipurpose rooms are used for fitness classes, martial arts, dance, and individual student use. Four full-sized multi-use courts are lined for basketball, volleyball, and badminton. The outdoor complex contains 10 regulation tennis courts, two sand volleyball courts, two basketball courts, one roller hockey court (also lined for basketball), and a large open grassy area for general recreational use. All required equipment is available for free checkout.

**Recreation Programs** include Intramural Sports, which consists of men's, women's, and coed intramural leagues in basketball, volleyball, softball, flag football, soccer, tennis, roller hockey, bowling, golf, and racquetball. Recreation classes include ballroom, hip hop, and many other dance styles, adult and children's karate, judo, tai chi chuan, yoga, tennis, and fitness classes. The Recreation and Sports Clubs program offers opportunities for competitive and social activities through skiing and snowboarding, paintball, badminton, and cycling.

**Outdoor Programs** consists of Team Excursions, which offers white-water rafting, backpacking, rock climbing, horseback riding, kayaking, and many other activities. The Team Excursions Challenge Course and Teambuilding Program is for all ages. The Outdoor Excursions Rental shop offers tents, sleeping bags, stoves, cross-country ski packages and snowboards for a fee. The UCR Karate Program is one of the finest in the nation, with seven team national championships to its credit. The program sponsors a nationally renowned tournament in May of each year with national and international participants. Recreation also sponsors Market Day, an arts and crafts fair held in December and May, featuring more than 75 vendors selling their wares on campus.

### Intercollegiate Athletics

Director: Stan Morrison, M.S.  
120 Physical Education Building  
(951) 827-5432; [www.gohighlanders.com](http://www.gohighlanders.com)

A member of the National Collegiate Athletics Association (NCAA) Division I and the Big West Conference, UCR competes in 17 sports: eight for men — baseball, basketball, cross country, golf, soccer, tennis, and indoor and outdoor track and field — and nine for women — basketball, cross country, golf, soccer, softball, tennis, indoor and outdoor track and field, and volleyball. Athletics programs are supported by student fees, general funds, and private gifts.

## Campus Health Center

Director: Deborah J. McCoy, M.R.C.  
Veitch Student Center  
(951) 827-3031

Health insurance, including waivers:  
(951) 827-5683; fax (951) 827-7171  
[campushealth.ucr.edu](http://campushealth.ucr.edu)

The Campus Health Center provides high quality, confidential medical care to students, with a focus on convenient, affordable, and accessible services. All registered students are eligible to use the center, which contains a comprehensive primary care clinic, supported by an in-house medical laboratory, pharmacy, and x-ray services. Specialty clinics include the Walk-in Clinic for urgent illness or injury that cannot wait for an appointment, Women's Health Clinic, Travel Clinic, Dental Clinic, and psychiatric services. In addition, the Preventive Care Program, through individual consultation and assessment, offers students the opportunity to explore a wide array of healthy lifestyle topics including weight management, optimal fitness, nutrition, smoking cessation, disease management, and stress reduction.

**Insurance** Student health insurance is a nonacademic condition of enrollment. All students are automatically enrolled in a health plan. The premium is billed on the student account. The Campus Health Center is the primary care facility for students in the mandatory insurance plans. Students who can demonstrate comparable insurance coverage from another source may apply to be waived from automatic enrollment in the mandatory plan. Visit the above Web site for deadlines to file a waiver request.

## Campus Media

### ***The Highlander* (Student Newspaper)**

101 Highlander Union Building (HUB)  
Newsroom (951) 827-3617; Business/Advertising (951) 827-5039  
[highlandernews.org](http://highlandernews.org)

*The Highlander* provides quality reporting and insightful editorials on campus-related issues, Riverside community-based issues, and coverage of UCR cultural and sports events. The paper is published every Tuesday during the academic year. It receives funding from advertising and a student fee. Students with a desire to write and a passion for journalism or graphic design as well as advertising can work for *The Highlander*. All students are welcome to attend weekly meetings every Monday at 5:15 p.m.

### **KUCR (88.3 FM in the Riverside area, [kucr.org](http://kucr.org) online)**

Director: Louis Vandenberg  
691 Linden Street  
(951) 827-3737

**[kucr.org](http://kucr.org)** (info, show schedules, and live on-line web-streaming)

KUCR, the student radio station of UCR, has been a vital and active element of the campus life since 1965. KUCR is real college radio in the classic mode, licensed by the FCC and broadcasting to the campus and Riverside community on air and on-line. KUCR programs are deep and diverse, presenting a wide variety of genres, from the most current indie rock and hip-hop, to world, classical music, and jazz. The station also features an excellent award-winning set of public affairs, news, and sports programs. KUCR also presents live concerts, public affairs lectures and panel discussions and does numerous in-person dj events on campus and in the community throughout the year. The station has a small core professional staff, with faculty participation, but features students at all levels, in management, programming, on-air dj's, sportscasters, producers, staffers and more. KUCR embodies the university's respect for diverse points of view, ethnic backgrounds, political beliefs, attitudes, and sexual orientations. KUCR doesn't duplicate the mainstream, but provides "alternative" programming not normally heard on commercial radio. The station broadcasts 24 hours a day, 365 days a year.

## Career Center

Director: Randall Williams, B.A.  
Veitch Student Center (Northwest wing)  
(951) 827-3631; [www.careers.ucr.edu](http://www.careers.ucr.edu)

The Career Center has twenty one professional and administrative staff members available to assist students with their career decision making, internship placement, graduate and professional school application, and the job search process. Open year-round, the center offers a career resource library, seminars and workshops, individual and group counseling, vocational testing and a comprehensive interactive website available 24 hours a day.

**Student Employment** The Career Center provides hundreds of part-time, temporary, and summer jobs posted at [www.careers.ucr.edu](http://www.careers.ucr.edu).

**Job Search Assistance** Students can use in-person and Web-based resources to practice interviews and get assistance in writing résumés. Recruiters visiting campus for interviews have included Abbott Vascular; Aon; Boeing; Deloitte & Touche LLP; Disney College Program; Enterprise Rent-A-Car; FedEx Ground; GEICO; Google; Merck; Northrop Grumman; Pacific Life; Raytheon; Target Corp.; State Farm Insurance Companies; The Pepsi Bottling Group, Inc.; Verizon; Wells Fargo Bank; Xerox Corp and Yahoo.

**Internship Program** Internships may be part-time volunteer experiences or may offer a salary or stipend. Students can earn credit for an internship if an academic component is completed on campus.

**Events** The Career Center hosts a number of annual job fairs (Career Night, Meet the Firms, Engineering and Technical Fair, Teacher Job Fair and Last Chance Fair), job search workshops, and on-campus interviews for career jobs and internships.

## Child Development Centers

Director: Klara Pakozdi, M.P.A.  
3333 Watkins Drive; Riverside, CA 92507  
(951) 827-3854; [Childservices.ucr.edu](http://Childservices.ucr.edu)

Early care and education services are available on campus for infants, toddlers, preschool, and kindergarten children (from two months through 5 years of age). The center is open to children of students, faculty, and staff of UCR and is accredited by the National Academy for Early Childhood Program Accreditation of the National Association for the Education of Young Children.

## Cultural Events

Director: Todd Wingate, M.A.  
353 Highlander Union Building (HUB)  
(951) 827-4629  
[culturalevents.ucr.edu](http://culturalevents.ucr.edu)

Cultural Events is a cultural, intellectual, and educational resource for the university and the surrounding communities. Artists who have performed on the Performing Arts Series include Philip Glass, Twyla Tharp, Laurie Anderson, Joe Goode, 33 Fainting Spells, Rennie Harris, Daniel Bernard Roumain, the Eroica Trio, The Vienna Choir Boys, Anoushka Shankar, Dianne Reeves, The American Brass Quintet, Altan, Margaret Cho, Danny Hoch, and Culture Clash.

## Counseling Center

Director: Laura Hammond, Ph.D.  
Veitch Student Center North Wing  
(951) 827-5531; [counseling.ucr.edu](http://counseling.ucr.edu)

The Counseling Center offers a wide range of confidential services aimed at helping UCR students with psychological difficulties that might interfere with their academic study or personal wellbeing. All registered UCR students can be seen in individual, couple, and group counseling. The Counseling Center offers help with stress management, such as the biofeedback program, a weekly Meditation and Relaxation Class, and on-line relaxation audio recordings. The Counseling Center also provides crisis intervention, consultation to students, and the university community, as well as workshops and presentations on mental health topics. The Counseling Center is open Monday-Friday, 8 am - 5 pm. Counselors are available 24 hours by phone at 951-UCR-TALK or (951) 827-5531.

## Cultural Student Programs

### **African Student Programs**

Director: Kenneth Simons, B.A.  
133 Costo Hall  
(951) 827-4576; [www.asp.ucr.edu](http://www.asp.ucr.edu)

African Student Programs (ASP) was established in 1968 to enhance the academic, cultural, and social development of and to retain students of African descent. Our purpose is to promote academic excellence by providing opportunities for students in their development as role models, leaders, professionals, and scholars.

### **Asian Pacific Student Programs**

Acting Director: William Caganap, B.A.  
244 Costo Hall  
(951) 827-7272 or -7274; [www.apsp.ucr.edu](http://www.apsp.ucr.edu)

Strives to promote a diverse learning environment at the UCR campus, providing the community with opportunities to learn from and about Asian and Pacific Islander students. Provides peer mentoring; new student

orientation; Asian and Pacific Islander Awareness Month; lecture, speaker, film, and video series; leadership training; residence hall outreach; and youth and community outreach.

### Chicano Student Programs

Director: Estella Acuña, B.A.  
145 Costo Hall; (951) 827-3821  
FAX: (951) 827-2189, [www.csp.ucr.edu](http://www.csp.ucr.edu)

Offers projects and services responding to the needs of Chicano/Latino students on campus. Support services include advising and individual counseling, referral information, and the coordination of special programs and activities such as the Raza Graduation Banquet, Semana de la Mujer, Día de los Muertos, Poesía Peligrosa, leadership training, new student/parent orientation, speaker series, community projects, and advisement of clubs and organizations.

### Native American Student Programs

Interim Director: Joshua Gonzales, M.B.A.  
229 Costo Hall; (951) 827-4143, (951) 827-3850  
FAX: (951) 827-4342, [www.nasp.ucr.edu](http://www.nasp.ucr.edu)

Provides educational, cultural, and social support for Native American students and all students on the UCR campus and surrounding communities through Native American events such as the American Indian speaker/film series, the annual Spirit of the Tribes 5K Run/Walk, the annual Medicine Ways Conference, the annual UCR Pow Wow, "Indian Time" radio program on KUCR (88.3 FM or [kucr.org](http://kucr.org)), community outreach, cultural workshops, and much more.

### Graduate Student Association

Highlander Union Building (HUB)  
(951) 827-3740  
[gsaucr@ucr.edu](mailto:gsaucr@ucr.edu); [gsa.ucr.edu](http://gsa.ucr.edu)

GSA represents all campus graduate students, including credential and medical students. Governed by the Graduate Student Council, which comprises representatives from each of UCR's graduate programs. Officers, elected at large, are the president, executive vice president, vice president of academic affairs, health insurance chair, public relations officer, and international student affairs officer.

It is supported by a \$24 per quarter fee for services such as the minigrant program that provides travel grants to graduate students who attend or present research at professional conferences, Grad Bash parties, and beverage mixers.

A member of the UC Student Association, which represents all UC students and has a lobby program in Sacramento, GSA is heavily involved in campus governance and appoints students to serve on various committees.

### Health Professions Advising Center

Associate Director: Gwen Hill, M.A.  
1114 Pierce Hall  
(951) 827-6233; [hpac.ucr.edu](http://hpac.ucr.edu) or [healthprofessions.ucr.edu](http://healthprofessions.ucr.edu)

The Health Professions Advising Center provides information, advising and support for UCR students planning to pursue a graduate degree in the health professions. Services include individualized advising, peer mentors, speakers, workshops, special events and other activities for students who wish to enhance their academic and extracurricular preparation for medical and other health professions schools/programs.

### Housing, Dining & Residential Services

Assistant Vice Chancellor: Andy Plumley, M.A.  
3595 Canyon Crest Drive  
Riverside, CA 92507  
(951) 827-6350; [housinginfo@ucr.edu](mailto:housinginfo@ucr.edu)  
[www.housing.ucr.edu](http://www.housing.ucr.edu)

UCR student housing provides a variety of on-campus living environments designed to encourage both academic pursuits and personal growth. On-campus living helps ensure that students can truly be a part of the college community, with access to valuable resources and opportunities to participate in activities that complement the classroom educational experience.

The **Residence Halls** are home to more than 3,000 students at all class levels living in double and triple rooms on coeducational halls. All Residence Hall rooms are furnished, heated and air-conditioned, with high speed data connectivity, telephone, and cable television service included. Some halls are composed entirely of students who share a common academic or social interest, including the following:

**CHASS Learning Community** First-year students in the College of Humanities, Arts, and Social Sciences

**Enginuity** First-year students in the Bourns College of Engineering

**CNAS Scholars Learning Community** Students in the College of Natural and Agricultural Sciences

**Honors Hall** Students admitted to UCR's University Honors Program

**Pre-Business Hall** Students in the College of Humanities, Arts, and Social Sciences Pre-Business Program

**Transfer Hall** Community of newly admitted transfer students

**Gender Neutral Housing Option** Students with diverse gender identities, expressions, and orientations

**Stonewall Hall** Students of diverse gender identities and sexual orientations, and gender diversity allies

**PATH** Pan-African Theme Hall

**Unete a Mundo** Latino/chicano cultural interest hall

Staff and residents work together to provide activities and programs that develop a sense of community and encourage social interaction. Educational support consists of academic study groups, tutorial assistance programs, seminars, computer labs, study rooms, and scheduled study hours. Social activities include weekly hall competitions, trips to the mountains and beach, theme dances, special dinners, mock game shows, cultural events, and intramural sports. Recreational centers feature television lounges, pool and ping-pong tables, video game machines, fitness rooms, piano rooms, and social lounges. On-site convenience stores provide snacks, school supplies, and toiletries. Several dining-plan and dining-facility options give students access to a convenient, quality culinary program.

The **Campus Apartments** offer 2500 continuing and graduate students the enhanced privacy of traditional apartment-style communities while retaining the important advantages of living on campus. Apartments range from economical, fully-furnished suites to furnished and unfurnished multi-bedroom, multi-bath apartment homes. All Campus Apartment homes include refrigerators, carpeting, window coverings, heating, air-conditioning, and cable television service. Most include full kitchens with and without dishwashers and microwave ovens. Campus Apartment communities may also feature a swimming pool, spa, picnic areas with barbecue grills, recreational and study rooms, computer lab, television lounge, vending machines, bike storage, secure laundry rooms, and a sport court/recreational green.

Mail delivery, equipment check-out and maintenance services are provided daily by onsite staff. Live-in staff plan social and educational events and activities. They are also trained and available to assist residents with questions, concerns, or advice regarding personal and maintenance needs, and peer conflicts 24 hours a day.

**Family Student Housing** is available to all students with families. The community is comprised of moderately-priced, unfurnished two- and three-bedroom duplex homes on 55 park-like acres at the edge of campus. Community amenities include a park with playground and picnic area, secure laundry facilities, and a community center with a computer lab. Homes include refrigerators, stove/oven units, heating, tile floors, and washer/dryer hook-ups and are cable-ready. Also provided are equipment check-out, grounds maintenance, repair services, water, trash removal, and an extensive family-oriented activities calendar. The Family Student Housing Eligibility & Assignment Policy can be viewed on the Housing, Dining & Residential Services website.

The **Community Living Program** is a web-based service designed to help students find housing opportunities in the community surrounding UCR. It also allows students to advertise themselves as potential roommates or search for other students who are looking for a roommate.

**Dining Services** prepares diverse, “authentic,” healthy cuisine and friendly service to the UCR campus community. Residential Restaurants are located at both Aberdeen-Inverness and Lothian Residence Halls. Entrees, grilled specialties, homemade pizza, international cuisine, salad, fruit, and desserts are served in an “all-you-care-to-eat” format.

Citrus Grove Catering is the official catering service for the campus. Catering can provide creative theme meals, banquets, picnics, barbecues, formal dinners, international menus, elegant lunches, and refreshment breaks to complement campus meetings and events.

The Highlander Union Building (HUB) offers a diverse range of culinary foods at La Fiamma’s Italian, El Sol Mexican, Honor Roll Sushi Cafe, Stacked Classic Deli, Panda Express, and the new Latitude 55 grill.

The Barn is a UCR social hub offering salads, burgers, pizza, and grilled sandwiches. Ivan’s@Hinderaker and The Coffee Bean & Tea Leaf offer coffee, tea, soft drinks, smoothies, grab’n’go salads, wraps and sandwiches, and other quick snacks.

## Highlander Union Building (HUB)

Director: Todd Wingate, M.A.  
(951) 827-3610; [hub.ucr.edu](http://hub.ucr.edu)

The Highlander Union Building (HUB) at UC Riverside is the “city center” of campus. A dynamic new facility supporting a wide range of events and services, the HUB makes a major contribution to the overall quality of campus life. Designed to host a wide range of diverse student programs, daily meetings and services, and special campus celebrations, the HUB is the place to be on campus.

The Highlander Union Building (HUB) offers:

- Places for gathering and social interaction, as well as quiet study areas
- A wireless network environment
- A new conference center featuring flexible, well-equipped meeting spaces and video-conferencing capabilities to accommodate a wide range of campus and community celebrations and other campus meetings and events
- Recreation and entertainment venues to support late-night social programming for students
- Comfortable and attractive food venues to support the active lifestyles of students, faculty, and staff

## International Education Center

University Village Suite 204  
(951) 827-4113; [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu)

**Overview** For 50 years the International Education Center (IEC) has served as UC Riverside’s gateway for international activities and exchange. The IEC provides advice and guidance for students interested in opportunities abroad, serves as a home for international students by providing adjustment and immigration support, and facilitates intercultural programming across campus. Within the IEC, students can engage in a full range of international activities designed to develop their intercultural skills and global awareness. Sample programs include the Global Connections Partner Program, International Education Week, and the weekly International Women’s Exchange. A wide range of study abroad options are available through UC’s Education Abroad Program, UCR’s Opportunities Abroad Program, UCR Summer Study Abroad (see earlier section on Summer Sessions and Special Programs), and UCR exchange partner programs. Students are encouraged to investigate the peer programs and global student organizations headquartered at the IEC and use the comprehensive multi-media resource library for cultural information, travel planning, study abroad scholarships, and international work, internship, volunteer, and teaching opportunities.

**Services to International Students** The IEC is dedicated to the success of UCR’s international student body. Professional staff offer personal, cultural, “the pre-arrival to post-graduation needs of international students; facilitate referrals to appropriate campus and community services; and provide advice and guidance on all immigration issues related to student status. International Peer Advisors (IPAs), a student volunteer team, welcome

newly arrived international students throughout the year. Prospective IPAs are always welcome.

**Education Abroad Program (EAP)** EAP is the University of California’s official study abroad program. Students interested in the language, literature, engineering, science, art, culture, history, government, business or social institutions of the EAP countries can gain substantially from first-hand academic and internship experiences. Opportunities are available at each class level. Options vary by duration (short term to academic year) and by academic focus. EAP operates in cooperation with nearly 120 host institutions in 35 countries worldwide, and annually sends approximately 4,700 students overseas. Details are in the Programs and Courses section of this catalog under Education Abroad Program.

**Planned Opportunities Abroad Agreement (POAA)** The IEC is the headquarters for students to access non-UC study abroad programs through the Opportunities Abroad Program (OAP). POAA permits students to study abroad for transfer credit and use eligible financial aid for either direct enrollment or through an independent program provider. POAA advising and applications are available at the IEC.

**Fulbright Student Program** The IEC coordinates the application process for enrolled UCR students who enter the national Fulbright Student Program competition. Graduating seniors and graduate students can find brochures, applications, and information on procedures at the IEC. The application period is May to September for participation in the following year. Graduating seniors should pay particular attention to the 600 Teaching English Assistantships offered by Fulbright in over 50 countries.

**Alternative Opportunities** Non-study opportunities abroad are popular. The IEC maintains liaisons with most of the international networks for volunteering, internships, employment, and budget travel.

## Lesbian Gay Bisexual Transgender Resource Center

Director: Nancy Jean Tubbs, M.S.  
245 Costo Hall  
(951) 827-2267; [out@ucr.edu](mailto:out@ucr.edu); [www.out.ucr.edu](http://www.out.ucr.edu)

Provides support, education, and advocacy regarding sexual orientation and gender identity for the UCR campus community. Offers a David Bohnett CyberCenter and a Resource Library of books, films and magazines for academic research, and personal growth; “drop-in” staff and peer support; and referrals to on- and off-campus resources. Programs include the Allies Safe Zone network, Peer Connections mentoring program, Tuesday Talks, Q-Camp Orientation, Winter Leadership Retreat, Lambda Celebration, Speakers Bureau panels, and campus-wide events in recognition of National Coming Out Day, Transgender Day of Remembrance, and other cultural awareness days.

## Ombudsman

University Ombudsman: Andrew Larratt-Smith, MDR  
88-90 Surge Building  
(951) 827-3213  
[ombuds@ucr.edu](mailto:ombuds@ucr.edu); [ombuds.ucr.edu](http://ombuds.ucr.edu)

The values of the Office of the Ombudsman are:

- Independence
- Impartiality
- Confidentiality
- Respect & Voice
- Fairness & Equity
- Renewal & Progress
- Success of the UCR Community

Anyone who has a university-related problem, or is in conflict with someone on campus, or thinks they have been treated unfairly may consult the Ombudsman. The Ombudsman will discuss a situation with the visitor privately, explain what policies may apply, and generate options and strategies for resolving the issue(s). He may also help in gaining a better understanding of personal conflict approaches and styles. He may also serve as an impartial facilitator or mediator to resolve disputes and conflict situations.

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Some topics that have been brought to the Ombudsman are:

- Academic, pedagogic or research issues;
- Workplace conflicts such as supervisor-staff issues;
- Unfair treatment, harassment, bullying, or discrimination;
- Clarification on university policies or procedures;
- Ethics issues or violations of policy

In all cases, the Ombudsman is confidential\*\*, independent, impartial and informal. The Ombudsman does not create files or maintain records on cases and people. The ombudsman will not take sides or provide legal advice, but does advocate for fairness and equity. The Ombudsman is an informal resource for the UCR campus community, and does not participate in formal processes. If appropriate, however, the Ombudsman can aid in identifying formal options and other resources that may be available.

\* Please remember that email is not a secure method for relaying personal or confidential information to the Ombudsman. Phone and in-person contact are encouraged. Because of the confidential, impartial, independent and informal nature of the Office of the Ombudsman, emails do not constitute notice to the university.

\*\*The exception to confidentiality is when the Ombudsman perceives there may be a threat of imminent harm to self or others."

### Police and Safety

Chief of Police: Michael Lane, B.A.  
3500 Canyon Crest Drive  
9-1-1 for reporting emergencies  
(951) 827-5222; [police.ucr.edu](http://police.ucr.edu)

The UC Police Department (UCPD) operates 24 hours per day, 365 days a year. UCR Police officers have full police powers and are responsible for all law enforcement activities and criminal investigations on the UCR campus. Police officers work in uniform or plain clothes patrolling the campus in marked and unmarked vehicles, on bicycles, and by foot.

**Incident Reporting** The university strongly encourages victims to report all criminal incidents, regardless of their nature, to the police immediately to ensure that appropriate action can be taken. Emergencies are best reported using the 9-1-1 system and nonemergencies using routine channels.

**Emergencies** Any police, fire, or medical emergency on campus can be reported by the 9-1-1 emergency reporting system, campus Emergency Call Boxes, campus emergency phones located in all campus building elevators and various campus buildings, or by walk-in reporting to the Police Department. Call boxes are located in or adjacent to most campus parking lots and are indicated on campus maps.

**Publication of Incidents** To increase awareness of campus safety at UCR, incidents of criminal activity within the campus community are publicized via the UCPD Annual Report and Crime Statistics online; an ongoing "press log" of Community Crime Alert Bulletins (posters); the "Rap Sheet" column in *The Highlander* student newspaper; the above Web site; "Crime Watch" columns in campus housing newsletters; regular police activity reports to campus housing administrators; e-mail to campus listserv members; and crime prevention programs.

The **Campus Safety Escort Service** is free to students, staff, faculty, and anyone else who needs an escort.

- Pick up any red phone on campus that says Campus Safety Escort Service, which will automatically connect to the Dispatcher Desk
- Walk up to the Dispatcher Desk located inside Rivera Library and ask for an escort
- Call the Dispatcher Desk at (951) 827-3772 and ask for an escort
- Wave to an escort on campus to be walked to a destination

### Student Alumni Association

Alumni and Visitor's Center  
(951) 827-2586; [www.saa.ucr.edu](http://www.saa.ucr.edu)

Affiliated with the UCR Alumni Association, a network of over 80,000 alumni, the Student Alumni Association prepares students for life after college through mentorships with successful alumni in the working world; career conferences in medicine, law, and business; dinners with alumni;

and other leadership-building activities. More information is available at the above website.

### Student Conduct and Academic Integrity Programs

Director: Laura Riley, M.Ed.  
104 Costo Hall  
(951) 827-4208; <http://conduct.ucr.edu>

Works to articulate to students the standards of behavior expected within the university community, educate students within the context of these standards, and ensure a safe and healthy environment conducive to learning and personal development. Any member of the university community wishing to bring alleged violations of standards to the attention of the university should contact this office.

### Student Life

Director: Diane LeGree, M.Ed.  
229 Highlander Union Building (HUB)  
(951) 827-7344; Fax (951) 827-2439  
[studentlife.ucr.edu](http://studentlife.ucr.edu)

Students can contact the office or go to the website to find ways to get involved on campus and find resources available to support student organizations, and fraternity and sorority life. Student Life coordinates programs to assist students with their personal and academic success through Highlander Orientation, the First Year Success Series, leadership resources and commuter programs. Student Life provides a variety of campus activities and events throughout the year. Visit the Student Life website for more information about services and resources provided by the office.

**Student Org Network** provides comprehensive support and assistance to student organizations, including assistance with university recognition, recruitment, program and event planning, major event management, accessing university resources, understanding and negotiating university policies and procedures, organizational development and enhancement, fundraising, promotion and marketing, and communication.

**Fraternity and Sorority Involvement Center** is a resource center for students involved in fraternity and sorority life, as well as for students who want to learn more about what fraternity and sorority life has to offer. The FSIC provides assistance with recruitment, event planning, scholarship, philanthropy, and community service for fraternity and sorority life on campus.

**Campus Activities** provides a variety of campus entertainment, activities, and opportunities for students, staff, and faculty to show their Highlander pride and spirit.

**Highlander Orientation** helps new first year students get to know the university and become acclimated to UCR. Highlander Orientation provides opportunities to meet other first year students, receive academic advising, enroll in classes, and learn about campus resources to help students be successful.

**First-Year Programs** assist new students in starting off on the right track in their college experiences through a number of programs, workshops, and leadership opportunities.

**Commuter Programs** provides resources and activities for commuter students to stay connected to UCR.

### Student Special Services

Director: Lenita Kellstrand, B.S.  
125 Costo Hall  
(951) 827-3861  
[specserv@ucr.edu](mailto:specserv@ucr.edu); [specialservices.ucr.edu](http://specialservices.ucr.edu)

Services for Students with Disabilities (SSD):  
(951) 827-4538

**Services for Students with Disabilities** Services for Students with Disabilities offers information to prospective students about available services, financial aid, housing, mobility, or other concerns related to attending UCR. Prospective students are invited to contact the office early in their planning to attend UCR. For specific information about admission requirements, contact the Office of Undergraduate Admissions or the Graduate Division.

Services available to regularly enrolled UCR students may include information on and referral to on- and off-campus services, mobility assistance, and academic support services. Students wishing to receive disability accom-

modations should contact SSD to request services. Accommodations are individually designed to meet the documented disability-related needs of each student.

**Veterans Affairs** Student Special Services is the certifying official and liaison with the U.S. Department of Veterans Affairs (VA) for students who are eligible for VA educational benefits as a result of their own military service or that of a parent or spouse. Students who receive such educational benefits may also be eligible for special VA-sponsored work-study and tutorial benefits. Students should be aware of the standards for satisfactory progress at UCR; the pertinent information is detailed under Scholarship Regulations in the Policies and Regulations section of this catalog. Also, it is the student's responsibility to report to Student Special Services any change in status that may affect benefits.

Children and spouses or registered domestic partners of veterans whose death or disability (at any percentage) was service connected may also be eligible for exemption from most university fees under provisions of the California Educational Code. Application may be made to any California county veterans services office. Claims for fee exemptions should be presented to the university during the academic year for which the claim applies. Retroactive approval can be granted only in situations in which students applied for the exemption in a timely manner but approval was delayed by the VA's processing of an original or reopened service-connected disability compensation or Dependency and Indemnity Compensation claim; a copy of the initial denial letter from the California Department of Veterans Affairs or county veterans services office is required to document such circumstances.

## Transportation and Parking Services

Director: Michael Delo, B.A.  
683 Linden Street  
Riverside, CA 92507  
(951) 827-TAPS (8277); [www.parking.ucr.edu](http://www.parking.ucr.edu)

All vehicles parking on the UCR campus must display a valid student, faculty/staff or visitor UCR parking permit at all times. Visitor parking is available at the Pay-By-Space dispensers, located in the following lots: Lots 1, 6, 10, 14 and lot 20. Additional Hourly and Daily permit dispensers are located in lots 25, 26, and 30, and after 4:00 p.m. in lots 4 and 24. See the above web site for other services.

## UCR Campus Store

Northeast of the Highlander Union Building (HUB)  
(951) 827-BOOK (2665); fax (951) 827-6098  
[www.ucrcampusstore.ucr.edu](http://www.ucrcampusstore.ucr.edu)

Students can purchase textbooks needed for their classes and most school supplies. The UCR Campus Store also carries a large selection of general interest books and sells gift items, backpacks, greeting cards, posters, art supplies, photographic supplies, office products, electronics accessories, UCR-imprinted sportswear, gifts, class rings, graduation caps and gowns, and graduation announcements.

**CompUCR**, located in the UCR Campus Store, sells computer hardware platforms, printers, and supplies, and computer books and software.

**Book Buy-Back** Students may sell used textbooks back to the Campus Store for up to 55 percent of their retail value during the first and last weeks of each quarter and during the school year for wholesale value. Check with the UCR Campus Store for more information.

## UCR Card Office

Highlander Union Building (HUB), Suite 249.  
Cost for a new R'Card: \$25  
Cost for a replacement R'Card: \$20  
(951) UCR-CARD (827-2273); [www.ucrcard.ucr.edu](http://www.ucrcard.ucr.edu)

The UCR ID Card is a multi-functional campus ID card. All students must carry and show an official campus ID for verification throughout the campus and the community. The R'Card will be used for most official campus transactions. This includes class attendance, checking out books from the libraries, and entering the Student Recreation Center and various other

buildings on campus. The R'Card can be a meal card for residence hall living and give access to residence hall rooms. Money can be added to the card's Bear Bucks account to use for copying and printing in the libraries, in most vending machines, and in laundry facilities at all campus housing locations. Bear Bucks may also be used at all Dining Services locations, the UCR Campus Store, at all campus convenience stores, and at participating merchants off-campus.

## University Advancement

Vice-Chancellor for University Advancement: Peter Hayashida, M.S.  
4128 Hinderaker Hall  
(951) UCR-NEWS (827-6397); [www.ucr.edu](http://www.ucr.edu)

Headed by the Vice Chancellor for University Advancement, this division has primary responsibility for generating external support for the campus, through fund-raising, strategic media relations, marketing, campus publications such as the campus magazine, video production services, the UCR home page, event planning, and alumni services, including a Student Alumni Association.

## Vocational Rehabilitation Services

State Department of Rehabilitation  
3130 Chicago Avenue  
Riverside, CA 92507  
(951) 782-6650 (Voice) or (951) 682-0143 (TTY)

Students who have a disability that handicaps them vocationally may be eligible for services from a state department of rehabilitation office, including vocational counseling and guidance, training (with payment of costs such as books, fees, and tuition), and job placement.

## Voter Registration

Voters who need to register for the first time, or reregister because they have moved or switched their party affiliation, can obtain forms from the Student Special Services Office in 125 Costo Hall. Voters may also request a form by calling 1-800-345-VOTE, or complete an online form at the Secretary of State's Web site at [ss.ca.gov](http://ss.ca.gov).

## The Well

*(Well-being, Empowerment, Life, Learning)*

Director: Jennifer Miller  
Highlander Union Building 248  
(951) 827-WELL; [www.well.ucr.edu](http://www.well.ucr.edu)

UCR offers a variety of wellness-related programs designed to support holistic student health and well-being. The WELL is a coordinated center for UCR's student wellness initiatives. The WELL serves to create a safe, supportive, and connected campus environment through the promotion of healthy minds, bodies and communities. The WELL provides accessible, robust resources and support for students in the areas of physical, social, emotional, cultural and spiritual wellness through a network of peer educators, mentors and professionals. The WELL is the office that collaboratively coordinates the UCR Student Wellness Initiative. The UCR Student Wellness Initiative (part of the UC system-wide Mental Health/Healthier Campus Climate Initiative) aims to highlight the programs and services of AVC/Dean of Students Office Diversity Initiatives and Mental Health Outreach Team, Campus Health Center, Counseling Center, Housing, Dining and Residential Services, International Education Center, Student Recreation Center, as well as The Well-Community Service Initiatives, Graduate Initiatives, Health Education, and Peer Initiatives.

## Women's Resource Center

Director: Adrienne Sims, Ed.D.  
260 Costo Hall  
(951) 827-3337; [www.wrc.ucr.edu](http://www.wrc.ucr.edu)

Offers programs, informal drop-in counseling, projects, and services that focus on issues facing women and men today. Provides advocacy for student survivors of sexual assault. Presents workshops, speakers, films, and activities addressing women's and men's concerns. Core services include the Campus Safety Escort Service, student computers, and study lounge.

# Prospective Undergraduates

## Campus Tours

Campus Tours Office  
1137 Student Services Building  
(951) 827-TOUR (8687), [TOUR@ucr.edu](mailto:TOUR@ucr.edu)  
[www.My.UCR.edu](http://www.My.UCR.edu)

Visitors can learn more about UCR's history, academic programs, research and other interesting facts from a current undergraduate student. One hour long campus, residence hall tours and engineering lab tours are offered weekdays and selected Saturdays. Prospective students and guests can also participate in a daily information session led by an admissions counselor. Reserve a tour online, space is limited.

## Early Academic Outreach Program (EAOP)

J-100 Bannockburn Village  
(951) 827-4695; fax (951) 827-4762  
[My.UCR.edu](http://My.UCR.edu); [eaop.ucr.edu](http://eaop.ucr.edu)

EAOP works directly with students at selected high schools to increase the number of students who have the opportunity to achieve a college education. Services include academic advising, campus tours, test preparation workshops, as well as workshops for parents and guardians.

## Gear Up

1460 E.Holt Avenue, Suite 114  
Pomona, CA 91767  
(909) 397-4711  
[www.trio.ucr.edu](http://www.trio.ucr.edu)

Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) is a federal program designed to prepare students to enter and succeed in college and postsecondary education. The program works with a cohort of students in the seventh grade and serves the same cohort until they graduate from high school. During these years, GEAR UP offers academic advising, tutoring, financial aid counseling, mentoring, cultural field trips, college tours, professional development workshops, and summer residential programs.

## HOST Program

Housing, Dining & Residential Services  
3595 Canyon Crest  
Riverside, CA 92507  
(951) 827-6506; [hostprogram@ucr.edu](mailto:hostprogram@ucr.edu)  
[www.housing.ucr.edu](http://www.housing.ucr.edu)

Prospective students can learn more about UCR's on-campus housing communities, and the campus in general by participating in the overnight HOST Program. Get a 24-hour taste of the campus as the guest of a current student resident. Attend classes with your student host, eat meals in a residential restaurant, attend a housing activity planned by live-in staff, and spend the night in an on-campus housing community. Cost of the program is \$20 and reservations are required.

## Services for Students with Disabilities

Student Special Services  
125 Costo Hall  
(951) 827-4538  
[specserv@ucr.edu](mailto:specserv@ucr.edu); [specialservices.ucr.edu](http://specialservices.ucr.edu)

Offers information to prospective students about available services, financial aid, housing, mobility, or other concerns related to attending UCR. Prospective students are invited to contact the office early in their planning to attend UCR. Services may include information and referral to on- and off-campus services, mobility assistance, and academic support services.

## TRiO Programs

3249 Student Services Building  
(951) 827-4685, fax (951) 827-5497  
[www.trio.ucr.edu](http://www.trio.ucr.edu)

TRiO Programs (Educational Talent Search, Upward Bound Program Classic, Upward Bound Program Oasis) help middle and high school students from Riverside and San Bernardino counties who have disadvantaged backgrounds complete high school and enroll in college. They provide tutorial services, information about college, mentoring, summer residential programs, cultural and educational field trips, and academic, financial, and personal counseling.

## University Eastside Community Collaborative (UECC)

2238 Student Services Building  
(951) 827-2514, fax (951) 827-3768  
[www.uecc.ucr.edu](http://www.uecc.ucr.edu)

The UECC provides an opportunity for UCR students to become engaged in their community through tutoring and mentoring in local schools and community centers. UECC members partner with local schools to provide tutoring to lower performing students in literacy and mathematics while working with the City of Riverside to develop and participate in meaningful projects that leave a lasting impact on Riverside's Eastside neighborhood.

Visit [My.UCR.edu](http://My.UCR.edu)

# Undergraduate Admission

## Application for Admission

Serving high school and community college students, their parents, and counselors, Undergraduate Admissions provides information about college preparation and admission of new undergraduate freshman and transfer students. Counselors visit high schools and community colleges to provide individual preadmission advising to students. Staff members and peer mentors are also available by appointment and on a walk-in basis for preadmission advising. The office hosts various events throughout the year which give prospective students and their families the opportunity to visit the campus; meet faculty, staff, and students; and learn more about UCR and its programs and opportunities for undergraduates. The office is also responsible for the addition of transfer units to the UCR records of continuing and readmitted students. Inquiries may be addressed to:

Undergraduate Admissions  
3106 Student Services Building  
University of California, Riverside  
Riverside, CA 92521  
(951) 827-3411

Prospective freshman students may email: [admit@ucr.edu](mailto:admit@ucr.edu)  
Prospective transfer students may email: [transfer@ucr.edu](mailto:transfer@ucr.edu)  
Prospective international students may email: [internationalinfo@ucr.edu](mailto:internationalinfo@ucr.edu)

## When to Apply

UCR accepts applications for admission to all undergraduate majors for Fall 2012 during the priority filing period, November 1-30, 2011.

## How to Apply

Prospective applicants may apply online: [www.universityofcalifornia.edu/apply](http://www.universityofcalifornia.edu/apply).

## Admission as a Freshman

UCR seeks to recruit and retain an academically strong student body that has demonstrated the rigorous preparation needed for admission to a major research institution and reflects the diversity of our state and region.

This section describes the two-phase undergraduate admission and selection process at UCR:

1. Satisfying the University of California minimum admission requirements
2. Selection by UCR according to the principles of Comprehensive Review, as determined by the UCR faculty

Meeting UC minimum admission requirements will not guarantee admission to UCR. Applicants who seek to increase their likelihood for admission should strive for achievement well beyond UC minimum requirements.

Final determination of admission will be made within the context of campus enrollment goals.

## UC Admission Requirements

**Freshmen** Students interested in entering the University as freshmen need to satisfy the following requirements:

1. Complete a minimum of 15 college-preparatory courses (a-g courses) with at least 11 finished prior to the senior year. The a-g course requirements are shown in the box on this page. More information about the a-g course requirements can be found at <http://www.universityofcalifornia.edu/admissions/freshman/requirements/a-g-requirements/index.html>. The university will accept only those "a-g" courses that appear on the official UC-Certified Course List for the California high school the student attended. The UC-Certified course list is available at <https://doorways.ucop.edu/list>.

2. Earn a grade point average (GPA) of 3.0 or better (3.4 for non-residents) in these courses with no grade lower than a C.

- a. **Honors Courses** The university assigns extra points for up to four year-long university-certified honors level, Advanced Placement, and/or UC-designated International Baccalaureate courses taken in grades 10, 11, and 12: A=5 points, B=4 points, C=3 points. College-level courses in the a-g college preparatory courses that are transferable to the university are also assigned honors grade points. A maximum of two yearlong courses taken in grade 10 are assigned honors points. Grades of D are not assigned extra honors points. (Extra points will be awarded to 10th graders only when they take honors courses that have been certified by the university as honors-level courses.) Acceptable honors-level courses include Advanced Placement courses, specific Standard Level and all Higher Level International Baccalaureate courses, and college courses that are transferable to the university.

## "a-g" Subject Requirement

- a. **History/Social Science** (2 years required)  
Two years of history/social science, including one year of U.S. history or one-half year of U.S. history and one-half year of civics or American government; and one year of world history, cultures, and geography.
- b. **English** (4 years required)  
Four years of college preparatory English that include frequent and regular writing, and reading of classic and modern literature. Not more than two semesters of ninth-grade English or no more than one year of approved ESL-type courses can be used to meet this requirement.
- c. **Mathematics** (3 years required, 4 years recommended)  
Three years of college preparatory mathematics that include the topics covered in elementary and advanced algebra and two- and three-dimensional geometry. Approved integrated math courses may be used to fulfill part or this entire requirement, as may math courses taken in the seventh and eighth grades that the student's high school accepts as equivalent to its own math courses.
- d. **Laboratory Science** (2 years required, 3 recommended)  
Two years of laboratory science providing fundamental knowledge in two of these three core disciplines: biology (which includes anatomy, physiology, marine biology, aquatic biology, etc.), chemistry, and physics. The final two years of an approved three-year integrated science program may be used to fulfill this requirement.
- e. **Language Other Than English** (2 years required, 3 years recommended)  
Two years of the same language other than English. Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading, composition, and culture. Courses in language other than English taken in the seventh and eighth grade may be used to fulfill part of this requirement if the student's high school accepts them as equivalent to its own courses.
- f. **Visual and Performing Arts** (1 year required)  
A single yearlong approved arts course from a single visual and performing arts discipline: dance, drama or theater, music, or visual art.
- g. **College Preparatory Electives** (1 year required)  
One year (two semesters) in addition to those required in "a-f" above, chosen from visual and performing arts (nonintroductory-level courses), history, social science, English, advanced mathematics, laboratory science, and language other than English (a third year in the language used in the "e" requirement or two years of another language).

3. Meet the examination requirement by taking the ACT with Writing or the SAT Reasoning Test by December of your senior year. We don't require SAT Subject Tests, but certain programs on some campuses recommend them, and you can use subject tests to satisfy the a-g requirements
- ACT Assessment Test plus Writing** To register, obtain a registration packet from a high school counselor or register at [act.org](http://act.org).
  - SAT Tests** To register, obtain a registration packet from a high school counselor or register at [collegeboard.com](http://collegeboard.com).

- |  |         |
|--|---------|
| a. History/Social Science  | 1 year  |
| b. English   | 2 Years |
| c. Mathematics   | 2 Years |
| d. Laboratory science  | 1 Year  |
| e. Language other than English   | 1 Year  |
| f. College-preparatory elective (chosen from the subjects listed above or another course approved by the university) | 4 Years |

### Graduation Rates

The following information is provided in compliance with the Federal Student Right-To-Know Act. It reflects four-, five-, and six-year cumulative graduation rates of the 3,456 incoming first-time freshmen for Fall 2004 and does not include graduation of students who transferred to other colleges and universities. All students enrolled in a degree program are included.

Graduated in four years	43.6%
Graduated in six years	67.4%

### Paths to Admission for California Residents

For the highest-achieving California applicants, we have two paths. If you are in one of the following groups and you are not admitted to any of the UC campuses you apply to, you'll be offered a spot at another campus if there's space.

- Statewide Path** Students who rank in the top 9 percent of California high school students according to the UC admissions index, which can be found at <http://www.universityofcalifornia.edu/admissions/freshman/california-residents/admissions-index/index.html>, or
- Local Path (ELC)** Students who rank in the top 9 percent of their graduating class at a participating high school. Students whose high schools participate in the ELC program – which most California high schools do – will be identified to be in the top 9 percent on the basis of GPA in UC-approved coursework completed in the 10th and 11th grades. To be considered for ELC, students must have a minimum GPA of 3.0 and complete the following a-g courses prior to their senior year:

After students enter their coursework and grades in their applications, the UC Central Processor will compare their GPAs to the historic top GPA for their school. Students who meet or exceed that GPA, will be identified as ELC and a note will be added to their application. For more information on this process, go to <http://www.universityofcalifornia.edu/admissions/freshman/california-residents/local-path/index.html>.

### Admission by Examination

Students who do not meet UC's minimum requirements, may be considered for admission to UC if they earn high scores on the ACT With Writing or SAT Reasoning Test and two SAT Subject Tests. To qualify by examination, students must achieve a minimum UC Score total of 410 (425 for nonresidents), calculated according to instructions that can be found at <http://www.universityofcalifornia.edu/admissions/freshman/requirements/examination/index.html>. Additionally, students must earn a minimum UC Score of 63 on each component of the ACT Assessment plus Writing or SAT Reasoning Test and on each SAT Subject Test.

Students may not use a SAT Subject Test to meet Admission by Examination if they completed a transferable college course in that subject with a grade of C or better.

**High School Proficiency Examination** If a student does not have a high school diploma, the university will accept the Certificate of Proficiency awarded by the State Board of Education upon successful completion of the California High School Proficiency Examination. The university also will accept proficiency examinations from other states, or the General Education Development (GED) Certificate, in place of a diploma. However, a student must still meet the UC admission requirements and campus selection requirements.

### Nonresidents of California

Two paths to UC eligibility exist for nonresidents at the freshman level. The first is the same as described under UC Admission Requirements and the second is the same as described under Admission by Examination, with the following exception:

Non-resident students must have a minimum GPA of 3.4.

## UCR Comprehensive Review

Comprehensive Review is the process by which UCR evaluates UC-eligible freshman applicants using multiple measures of achievement and promise, while considering the context in which each student has demonstrated accomplishment. UCR will calculate an Academic Index Score (AIS) for all UC-eligible freshman applicants. The faculty of UCR have designated the measures described below to be used to calculate the AIS. Admission to UCR will be determined within the context of campus enrollment goals. Although no particular AIS will guarantee admission to UCR, prospective students who strive for the highest possible AIS increase their likelihood for admission.

**High School GPA** The strength of an applicant's high school GPA is the strongest indicator that a student will be successful within an academically challenging UC environment. The capped GPA is calculated on the basis of all completed "a-g" courses with extra points added for UC-approved honors courses taken in grades 10 and 11, capped at 8 semesters. A capped GPA considers the extra points earned for honors-level courses and may exceed 4.0 for some students.

**ACT Assessment Plus Writing or SAT Reasoning Test** Provide another effective measure for determining the potential for success of a UCR applicant.

**Advanced Placement (AP) or International Baccalaureate (IB) courses** - AP and IB courses prepare students for college-level coursework. Therefore, students who take and do well in these courses tend to have a high probability for success within the UC environment.

**Low Family Income** Students who demonstrate high academic achievement, despite low socioeconomic status, are likely to exhibit persistence, maturity, and insight. Low family income is determined based on total family members and household income.

**First-Generation University Attendance** UC-eligible applicants who are the first in their immediate family to attend college are apt to have personal strengths that will contribute to their academic success. Students whose parents have not graduated from a four-year college or university are qualified for first-generation university attendance.

## Nontraditional Student Admission

UC Riverside has developed an admission program for homeschooled or other nontraditionally educated students in recognition of the benefits of the education these students have received, including the depth of learning, socialization, maturity, creativity, and vision. These qualities provide excellent foundations for pursuing an education at UC Riverside.

Visit <http://www.my.ucr.edu/admissions/paths.aspx> for more information about how UCR defines a homeschooled or other nontraditional education and specific admission requirements

## International Admission

Complete information on how to apply to UC Riverside as an international student can be found at <http://www.my.ucr.edu/admissions/international.aspx>. The credentials of an international applicant — a student who holds or expects to hold a student, exchange, visitor, diplomatic, or any other visa and who wishes to attend school in the United States as an undergraduate — are evaluated in accordance with the general regulations governing admission. UCR uses the Student Exchange and Visitor Information System (SEVIS) for all nonimmigrant F- and J-status students.

Students may apply electronically during the priority filing periods at [www.universityofcalifornia.edu/admissions/undergradapp](http://www.universityofcalifornia.edu/admissions/undergradapp). Early in the application filing period, students should submit the following to Undergraduate Admissions: official certificates and detailed transcripts of record, including hours and marks, accompanied by English translations; course syllabi; results of the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) examination. An applicant from another country whose native language is not English must achieve a score of 550 (paper-based), or 80 (Internet-based) on the TOEFL or a score of 7 on the IELTS.

Students may receive more information about the TOEFL at [toefl.org](http://toefl.org). Students may receive more information about the IELTS at [www.ielts.org](http://www.ielts.org).

Results of the test should be forwarded to Undergraduate Admissions. Applicants living locally should contact Undergraduate Admissions (see address below) for further information concerning other test options or completion of an acceptable English composition course to clear the requirement.

Generally, financial assistance from the university is not available to non-immigrant visa students. International students must provide proof that they possess sufficient funds to meet their educational commitments while studying in the United States. International students are considered nonresidents of California and are assessed the nonresident tuition in addition to the fees paid by legal residents of California.

For inquiries about the admission of international undergraduate students:

International Specialist  
Undergraduate Admissions  
3106 Student Services Building  
University of California, Riverside  
Riverside, CA 92521, U.S.A.; [internationalinfo@ucr.edu](mailto:internationalinfo@ucr.edu)

## Transfer Student Admission

The university considers a transfer applicant a student who has graduated from high school and enrolled in a regular session at a college or university immediately following the summer after high school graduation. (Students cannot disregard their college record and apply as freshmen.)

**California Residents** must complete the following to meet minimum admission requirements:

1. Complete 60 semester (90 quarter) units of transferable college credit with at least a 2.4 GPA (2.8 for nonresidents). No more than 14 semester (21 quarter) units may be taken Pass/Not Pass.
2. Complete the following seven transferable college courses, earning a grade of C or better in each course:
  - a) Two courses in English (1 course in English Composition, 1 course in Critical Thinking);
  - b) One course in mathematical concepts and quantitative reasoning;
  - c) Four courses chosen from at least two of the following subject areas: arts and humanities, social and behavioral sciences, and physical and biological sciences.

Each course must be worth at least 3 semester (4–5 quarter) units.

Students who satisfy the Intersegmental General Education Transfer Curriculum (IGETC) prior to transferring to UC, may satisfy the seven-course pattern outlined above, depending on the courses taken. For more information, visit [www.assist.org](http://www.assist.org).

Students who were eligible for admission to the university when they graduated from high school — meaning that they were identified to be Statewide Eligible or Eligible in the Local Context — may be eligible for transfer to non-selecting majors in the College of Humanities, Arts, and Social Sciences if they have a 2.0 GPA in all transferable course work.

**Nonresidents of California** The minimum admission requirements for nonresidents are very similar to those for residents. Students who are not California residents should consult with Undergraduate Admissions for details. However, nonresidents must have a GPA of 2.80 or higher in all transferable college course work.

## College-Level Examination Program

The UC does not grant credit for scores earned on the College-Level Examination Program (CLEP).

## UC Intercampus Transfer

A regular undergraduate student who is registered at any campus of the UC may apply for transfer to another campus of the UC by filing the *UC Undergraduate Application for Admission and Scholarships*. Fees and procedures are the same for all undergraduates, and there is no special procedure for intercampus transfer.

An undergraduate student in good standing, currently registered at UCR, may apply for intercampus visitor status at another UC campus for one term. Forms and instructions are available at the Office of the Registrar, 2249 Student Services Building.

## Student Conduct

Disciplinary suspension or dismissal from a previously attended educational institution is considered in the admission decision.

## Credits, Transcripts, and Test Scores

**Credit for English-as-a-Second-Language Course Work** Students whose first language is not English may receive up to 12 quarter units of credit for English-as-a-second-language course work. Students may receive workload credit (for financial aid purposes) for courses taken beyond this 12-unit limit but will not receive additional unit credit applicable to the bachelor's degree.

**Credit for Native Language** Students whose first language is not English may receive credit for course work in their native language and literature, provided such courses were completed at the college level in the country of the first language or at the upper-division or graduate level at UCR or another accredited English-speaking institution.

**Unit Credit for Courses Taken Elsewhere** The University grants unit credit only for courses consistent with its curriculum that have been completed at other accredited colleges and universities. To be accepted for credit, the courses must be comparable to those offered at the university.

Undergraduate Admissions determines the acceptability of courses taken at an institution other than the university. The faculty of the particular school or college in which the student plans to enroll determines the applicability of such course work in satisfaction of degree requirements.

As an integral part of the system of public education of California, the university accepts approved transfer courses at full unit value that have been completed with satisfactory grades in the community colleges of the state of California. Once a student has earned 70 semester (105 quarter) units acceptable toward a university degree, no further unit credit will be granted for courses completed at a community college. Subject credit, however, may still be earned.

**Transcripts and Test Scores** Undergraduate Admissions requires complete, accurate, and up-to-date information about a student's academic program and work in progress in order to process and respond to the application in a timely manner. The transcript and other documents submitted as part of the application become the property of the university; they cannot be returned or forwarded in any form to another college or university.

### Selection Criteria — Transfer Applicants

UCR attempts to accommodate as many qualified students from other universities and colleges as possible, particularly as juniors and seniors. In addition to meeting minimum UC eligibility requirements, transfer students will be selected on the basis of academic preparation as assessed by their GPA in all transferrable coursework and completion of required major preparatory coursework where applicable. Applicants with 120 quarter units or more are also subject to screening beyond the minimum requirements for transfer students.

**School of Business Administration** Admission is selective based on the GPA in all transferrable coursework with a minimum GPA of 2.5. Applicants must complete all breadth requirements (or the IGETC), four of six published major prerequisites, and two lower-division business prerequisites (with a minimum GPA of 2.5). Further information may be obtained from The School of Business Administration, 2340 Olmsted Hall, at (951) 827-4551.

**Bourns College of Engineering** Students are selected on the basis of academic preparation. Admission is selective based on the GPA in all transferrable coursework with a minimum GPA of 2.8, and completion of required major preparatory course work. See Admission to Majors under the Marlan and Rosemary Bourns College of Engineering section of this catalog. For further information call Student Academic Affairs at (951) 827-ENGR (3647).

**College of Natural and Agricultural Sciences** Students are selected primarily on the basis of academic preparation, as assessed by their GPA in academic coursework and strength of preparation for the intended major. Admission is selective based on the GPA in all transferrable coursework with a minimum GPA of 2.7. Applicants for majors in Biochemistry, Biological Sciences, Chemistry, and Physics must have completed one-year course sequences in three specified areas of science and mathematics. Applicants to the Plant Biology major must have completed a one-year sequence in lower-division General Chemistry and course work equivalent to BIOL 005A, BIOL 05AL, and BIOL 005B. See Admission to Majors under the College of Natural and Agricultural Sciences section of this catalog. For further information call Student Academic Affairs at (951) 827-7294.

**College of Humanities, Arts and Social Sciences.** Admission is selective based on GPA in all transferrable coursework with a minimum GPA of 2.4. Psychology and Psychology/Law and Society applicants must have a minimum GPA of 2.7 in all transferable college coursework. For further information call Student Academic Affairs at (951) 827-3683.

**120 Quarter Units or More** Applications from UC-eligible applicants with 120 quarter units or more of transfer credit are reviewed by the Dean of the College for completion of a specified pattern of courses that provides continuity with upper-division courses within the major.

**Freshman Applicants** Applicants are notified if a preliminary high school transcript is required. Applicants are responsible for requesting that testing agencies report examination scores for (1) either the ACT Assessment plus Writing or SAT Reasoning Test and, although not required but recommended for certain majors, (2) two SAT Subject Tests to UCR Undergraduate Admissions.

Admitted students must forward an official final high school transcript that shows the date of graduation, final transcript(s) for college work attempted, and official passing scores from Advanced Placement or International Baccalaureate specific Standard Level and all Higher Level examinations on or before July 15.

**Transfer Applicants** Applicants are notified if the university requires a preliminary transcript(s). Applicants must request a final transcript from each college they attended. A transcript from the last high school they attended may also be required. Attendance at any other school or college after an application has been filed is considered to be part of the student's record and must be reported to Undergraduate Admissions.

## Admission to Special Categories

Applications for admission to special categories must be filed during the application filing periods. The personal statement should include a statement of goals. Contact Undergraduate Admissions for further details. Students with no specific degree plans or goals are encouraged to enroll in courses through University Extension.

**Limited Status** A person who holds a bachelor's degree or has completed a substantial amount of college work and who, because of special circumstances, requires specific courses toward a definite objective and for a limited period may apply for admission in Limited Status. Undergraduate Admissions determines eligibility for admission, and the status requires the approval of the dean of the appropriate college. Admission is for a specified period of time, and the student must maintain a prescribed scholastic average. Units earned are not transferable to an advanced degree.

**Second Baccalaureate** Occasionally, a student whose educational objective has changed substantially after receiving the bachelor's degree may be considered for admission to a program for a second degree. The second baccalaureate requires senior residency and is subject to the university requirements for graduation, as well as the requirements of the college in which the second degree is to be taken, including all breadth, distribution, and major requirements. Undergraduate Admissions determines eligibility for admission, and the status requires the approval of the dean of the appropriate college. Applicants must be fully eligible for admission to the university, and their records must indicate strong probability of success in the new area. Students should check each college's specific requirements for Limited Status/Second Baccalaureate at the specific college Web site.

## Notification of Admission

Each application is considered individually; therefore, the length of time before notification may vary depending upon the circumstances of each applicant. Most fall quarter freshman applicants are notified of their status by March 31; transfer applicants are notified by May 1. In some cases, complete transcripts of course work are required before a final decision can be made.

Applicants should monitor the status of their application at **My.UCR.edu**. The Web site contains valuable information about admission procedures, course enrollment, housing, financial aid, and upcoming events. When offered admission by the university, students are asked to sign and return a Statement of Intent to Register (SIR) accompanied by a nonrefundable fee of \$100. This amount will be applied toward payment of university fees, provided the students register in the quarter to which they are admitted.

## Concurrent Enrollment

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Taking courses at another college or university, including UCR Extension, while in residence at UCR is called concurrent enrollment. See Finances and Registration for the policy regarding concurrent enrollment for continuing students.

## Reapplication

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Application for admission is for a specific term. If the student is not eligible for admission, or is admitted and does not register, the university requires a new application and an application fee if the student wants to be admitted to another term. The new application will be considered in light of the admission requirements in effect and the space available on campus at the time of application.



With an outstanding faculty who are nationally recognized in teaching and research, the Psychology Department at UCR provides a stimulating educational experience and investigates a remarkable variety of psychological topics.

# International Baccalaureate

The university grants 8 quarter units credit for each International Baccalaureate (IB) higher level examination on which a student scores 5 or higher. Higher level examinations are considered honors courses. The university does not grant credit for subsidiary level examinations. Some higher level examinations may be considered equivalent to freshman level courses in the subject and may be used to satisfy general education or breadth requirements.

The units granted for IB examinations are not counted toward the maximum number of credits required for formal declaration of an undergraduate major or the maximum number of units one may accumulate prior to graduation from the university. Students who enter the university with IB credit do not have to declare a major earlier than other students nor are they required to graduate earlier.

## International Baccalaureate Examination Credit

IB Examination	IB Score	Unit Credit	Bourns College of Engineering	College of Humanities, Arts and Social Sciences/School of Business Administration	College of Natural and Agricultural Sciences
Art/Design	5, 6, 7	4 4	Humanities (Fine Arts) breadth Elective	Humanities (Fine Arts) breadth Elective	Humanities (Fine Arts) breadth Elective
Biology	5, 6, 7	4 4	Natural Sciences and Mathematics (Biological Sciences) breadth Elective	Natural Sciences and Mathematics (Biological Sciences) breadth Elective	Elective Elective
Chemistry	5, 6, 7	4 4	Natural Sciences and Mathematics (Physical Sciences) breadth Elective	Natural Sciences and Mathematics (Physical Sciences) breadth Elective	Elective Elective
Classical Languages	5, 6, 7	4 4	“Additional Humanities” breadth Elective	“Additional Humanities” breadth Elective	“Additional Humanities” breadth Elective
Computer Science	5, 6, 7	4 4	Elective Elective	Computer Science breadth Elective	Computer Science breadth Elective
Economics	5, 6, 7	4 4	Credit for ECON 002 Credit for ECON 003	Credit for ECON 002 Credit for ECON 003	Credit for ECON 002 Credit for ECON 003
Geography	5, 6, 7	4 4	Credit for GEO 002 “Additional Social Sciences” breadth	Credit for GEO 002 “Additional Social Sciences” breadth	Credit for GEO 002 “Additional Social Sciences” breadth
History	5, 6, 7	4 4	Credit for HIST 020 Elective	Credit for HIST 020 Elective	Credit for HIST 020 Elective
History of the Islamic World	5, 6, 7	4 4	“Additional Humanities” breadth Elective	“Additional Humanities” breadth Elective	“Additional Humanities” breadth Elective
English (“Language A1”)	5  6, 7	4 4 4 4	Credit for ENGL 001A Elective (or 8 elective units if student enrolls in ENGL 001A) Credit for ENGL 001A Credit for ENGL 001B	Credit for ENGL 001A Elective (or 8 elective units if student enrolls in ENGL 001A) Credit for ENGL 001A Credit for ENGL 001B	Credit for ENGL 001A Elective (or 8 elective units if student enrolls in ENGL 001A) Credit for ENGL 001A Credit for ENGL 001B
Math	5, 6, 7	4 4	Credit for MATH 009A Elective	Credit for MATH 009A Elective	Credit for MATH 009A Elective
Music	5, 6, 7	4 4	Humanities (Fine Arts) breadth Elective	Humanities (Fine Arts) breadth Elective	Humanities (Fine Arts) breadth Elective
Philosophy	5, 6, 7	4 4	Credit for PHIL 001 Elective	Credit for PHIL 001 Elective	Credit for PHIL 001 Elective
Physics	5, 6, 7	4 4	Elective Elective	Natural Sciences and Mathematics (Physical Sciences) breadth Elective	Elective Elective
Psychology	5  6, 7	4 4 4 4	Social Sciences (Psychology) breadth Elective Credit for PSYC 002 Elective	Social Sciences (Psychology) breadth Elective Credit for PSYC 002 Elective	Social Sciences (Psychology) breadth Elective Credit for PSYC 002 Elective
Social Anthropology	5, 6, 7	4 4	Credit for ANTH 001 Elective	Credit for ANTH 001 Social Sciences breadth	Credit for ANTH 001 Social Sciences breadth
Theatre Arts	5, 6, 7	4 4	Credit for THEA 070 Elective	Credit for THEA 070 Humanities (Fine Arts) breadth	Credit for THEA 070 Humanities (Fine Arts) breadth
Languages other than English	5, 6, 7	8	Elective	Elective	Elective

**Note** Certain credit limits apply to Advanced Placement and International Baccalaureate tests offered in similar subject areas.

See “Programs and Courses” for subject abbreviations

## Advanced Placement

The university grants credit for all College Board Advanced Placement Tests for which a student scores 3 or higher. The credit may be subject credit, graduation credit, or credit toward general education or breadth requirements, as determined by each college office.

The units granted for AP tests are not counted toward the maximum number of credits required for formal declaration of an undergraduate

major or the maximum number of units a student may accumulate prior to graduation from the university. Students who enter the university with AP credit do not have to declare a major earlier than other students, nor are they required to graduate earlier.

College courses taken prior to or after enrolling at the university may duplicate the content of AP examinations. In these cases, the university may not award credit for both the course and the AP exam. The university grants credit for Advanced Placement tests as described below.

### College Board Advanced Placement Examination Credit

AP Examination	AP Score	Unit Credit	Bourns College of Engineering	College of Humanities, Arts and Social Sciences/School of Business Administration	College of Natural and Agricultural Sciences
Art History	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
Studio Art <sup>1</sup>		4	Elective	Elective	Elective
•Drawing	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
•2-D Design	3, 4, 5	4	Elective	Elective	Elective
•3-D Design	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
•General Portfolio <sup>3</sup>	3, 4, 5	4	Elective	Elective	Elective
Biology	3, 4, 5	4	Natural Sciences and Mathematics (Biological Sciences) breadth	Natural Sciences and Mathematics (Biological Sciences) breadth	Elective
		4	Elective	Elective	Elective
Chemistry	3, 4, 5	3	Credit for CHEM 001W plus Natural Sciences and Mathematics (Physical Sciences) breadth	Credit for CHEM 001W	Credit for CHEM 001W
		5	Elective	Elective	Elective
Chinese Language and Culture	3, 4	8	Elective	Elective	Elective
	5	4	“Additional Humanities” breadth		
		4	Elective		
Computer Science <sup>2</sup>					
•A Examination	3	2	Elective	Elective	Elective
	4, 5	2	Credit for CS 010	Elective; placement after individual counseling	Elective; placement after individual counseling
•AB Examination <sup>3</sup>	3, 4	4	Credit for CS 010	Credit for CS 010	Credit for CS 010
	5	4	Credit for CS 012	Credit for CS 012	Credit for CS 012
			Subject credit for CS 010		
Economics					
•Macroeconomics	3, 4, 5	4	Credit for ECON 002	Credit for ECON 002	Credit for ECON 002
•Microeconomics	3, 4, 5	4	Credit for ECON 003	Credit for ECON 003	Credit for ECON 003
English <sup>1</sup>					
•Language/Composition	3	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Elective	Elective	Elective
			(or 8 elective units if the student enrolls in ENGL 001A)	(or 8 elective units if the student enrolls in ENGL 001A)	(or 8 elective units if the student enrolls in ENGL 001A)
	4, 5	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Credit for ENGL 001B	Credit for ENGL 001B	Credit for ENGL 001B
•Literature/Composition	3	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Elective	Elective	Elective
			(or 8 elective units if the student enrolls in ENGL 001A)	(or 8 elective units if the student enrolls in ENGL 001A)	(or 8 elective units if the student enrolls in ENGL 001A)
	4, 5	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Credit for ENGL 001B	Credit for ENGL 001B	Credit for ENGL 001B
Environmental Science	3	4	Credit for ENSC 001	Credit for ENSC 001	Credit for ENSC 001
	4, 5	4	Credit for ENSC 002	Credit for ENSC 002	Credit for ENSC 002 (and subject coverage for ENSC 001 for Environmental Science majors)

<sup>1</sup>Maximum credit 8 units

<sup>2</sup>Maximum credit 4 units

<sup>3</sup>No longer offered.

## College Board Advanced Placement Examination Credit

AP Examination	AP Score	Unit Credit	Bourns College of Engineering	College of Humanities, Arts and Social Sciences/School of Business Administration	College of Natural and Agricultural Sciences	
French •Language	3, 4	8	Elective	Elective	Elective	
		4	“Additional Humanities” breadth			
		4	Elective			
	5	4	Humanities (Literature) breadth	Humanities (Literature) breadth	Humanities (Literature) breadth	
		4	Elective	Elective	Elective	
German •Language	3, 4	8	Elective	Elective	Elective	
		4	“Additional Humanities” breadth			
		4	Elective			
	5	4	Elective	Humanities (Literature) breadth	Humanities (Literature) breadth	
		4	Elective	Elective	Elective	
Government and Politics •United States Government	3, 4, 5	4	Credit for POSC 010	Credit for POSC 010	Credit for POSC 010	
		4	Credit for POSC 015	Credit for POSC 015	Credit for POSC 015	
	3, 4, 5	4	Credit for POSC 015	Credit for POSC 015	Credit for POSC 015	
History •United States	3, 4, 5	4	Credit for HIST 017A	Credit for HIST 017A	Credit for HIST 017A	
		4	Credit for HIST 017B	Credit for HIST 017B	Credit for HIST 017B	
		4	Humanities breadth	Humanities breadth	Humanities breadth	
	•European	3, 4, 5	4	Elective	Elective	Elective
			4	Humanities (World History) breadth	Humanities (World History) breadth	Humanities (World History) breadth
	•World	3, 4, 5	4	Elective	Elective	Elective
			4	Elective	Elective	Elective
Human Geography	3, 4, 5	4	Social Science (Geography) breadth	Social Science (Geography) breadth	Social Science (Geography) breadth	
Italian Language and Culture <sup>3</sup>	3, 4	8	Elective	Elective	Elective	
		4	“Additional Humanities” breadth			
		4	Elective			
	5	4	Elective			
Japanese Language and Culture	3, 4	8	Elective	Elective	Elective	
		4	“Additional Humanities” breadth			
		4	Elective			
	5	4	Elective			
Latin •Virgil	3, 4	8	Elective	Elective	Elective	
		4	“Additional Humanities” breadth			
		4	Elective			
	5	4	Humanities (Literature) breadth	Humanities (Literature) breadth	Humanities (Literature) breadth	
		4	Elective	Elective	Elective	
Mathematics <sup>1,4</sup> •AB Examination	3, 4, 5	4	Credit for MATH 009A (additional subject coverage may be granted after individual counseling)	Credit for MATH 009A (additional subject coverage may be granted after individual counseling)	Credit for MATH 009A (additional subject coverage may be granted after individual counseling)	
		4	Credit for MATH 009A	Credit for MATH 009A	Credit for MATH 009A	
		4	Credit for MATH 009B (additional subject coverage may be granted after individual counseling)	Credit for MATH 009B (additional subject coverage may be granted after individual counseling)	Credit for MATH 009B (additional subject coverage may be granted after individual counseling)	
	•BC Examination	3, 4, 5	4	Credit for MATH 009A	Credit for MATH 009A	Credit for MATH 009A
			4	Credit for MATH 009B (additional subject coverage may be granted after individual counseling)	Credit for MATH 009B (additional subject coverage may be granted after individual counseling)	Credit for MATH 009B (additional subject coverage may be granted after individual counseling)
	•AB Subscore (from BC examination)	3, 4, 5	4	Credit for MATH 009A (additional subject coverage may be granted after individual counseling)	Credit for MATH 009A (additional subject coverage may be granted after individual counseling)	Credit for MATH 009A (additional subject coverage may be granted after individual counseling)
	Music •Theory	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
4			Elective	Elective	Elective	
•Listen and Literature <sup>3</sup>		3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
			4	Elective	Elective	Elective

## College Board Advanced Placement Examination Credit

AP Examination	AP Score	Unit Credit	Bourns College of Engineering	College of Humanities, Arts and Social Sciences/School of Business Administration	College of Natural and Agricultural Sciences
Physics <sup>1</sup>					
•Examination B	3, 4, 5	4	Elective	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
		4	Elective	Elective	Elective
•Examination C: Mechanics	3, 4	4	Elective	Elective	Elective
	5	4	Credit for PHYS 002A	Credit for PHYS 002A	Credit for PHYS 002A
•Examination C: Electricity and Magnetism	3, 4	4	Elective	Elective	Elective
	5	4	Credit for PHYS 002B	Credit for PHYS 002B	Credit for PHYS 002B
Psychology					
	3	4	Social Sciences (Psychology) breadth	Social Sciences (Psychology) breadth	Social Sciences (Psychology) breadth
	4, 5	4	Credit for PSYC 002	Credit for PSYC 002	Credit for PSYC 002
Spanish					
•Language	3, 4	8	Elective	Elective	Elective
	5	4	“Additional Humanities” breadth		
		4	Elective		
•Literature	3, 4, 5	4	Humanities (Literature) breadth	Humanities (Literature) breadth	Humanities (Literature) breadth
		4	Elective	Elective	Elective
Statistics					
	3	4	Credit for STAT 040	Credit for STAT 040	Credit for STAT 040 3, 4, 5
	4, 5	4	Credit for STAT 040	Credit for STAT 048	Credit for STAT 048

<sup>1</sup>Maximum credit 8 units<sup>2</sup>Maximum credit 4 units<sup>3</sup>No longer offered.<sup>4</sup>Maximum credit 4 units for AB examination and AB Subscore examination

See “Programs and Courses” for subject abbreviations

# Finances and Registration

## Fees and Expenses

Student expenses depend upon a great many factors that should be considered carefully before planning a budget. Financial help needed — beyond funds that students or their families are able to provide — should be determined well in advance of the entering quarter. Use the charts in this section as guides to planning and visit [finaid.ucr.edu](http://finaid.ucr.edu) for detailed information on costs to attend UCR.

### Residence Classification

Students pay nonresident supplemental tuition if they have not been living in California for more than one year immediately prior to the residence determination date for the term in which they propose to register at UCR. Along with the criterion physical presence, the other criteria are intent to become a California resident and financial independence. Information on these three criteria is provided at <http://registrar.ucr.edu/QuickLinks/Residency.htm> and below, under Residence for Tuition Purposes.

Residence classification of new, readmitted, and continuing students is made for each term and at each campus of the UC. Classifications are based on evidence presented in and supporting each student's Statement of Legal Residence. Students sign all Statement of Legal Residence forms under oath, and further information required may need to be provided under oath, by declaration or affidavit.

The residence determination date is the day instruction begins at the last of the UC campuses to open for the quarter and, for schools on the semester system, the day instruction begins for the semester. Students classified as nonresidents retain that status until they apply for, and receive, a new classification. Students planning to file for residence status after their first year should talk with the residence affairs officer well before the appropriate residence determination date, preferably during their first few weeks in California. Students may apply for classification as California residents as soon as they meet all three criteria for residence and, if successful in changing their status, would not pay nonresident supplemental tuition for subsequent quarters if they continued to meet the criteria.

**Residence Determination** All questions concerning residency are referred to the residence affairs officer in the Office of the Registrar. No other campus personnel are authorized to supply information regarding residence requirements for tuition purposes. Students wishing to appeal a final decision on residence classification by the residence affairs officer are assisted and referred to the appropriate member of the General Counsel's Office.

### Late Fees

Late fees are assessed to students who fail to make payments or file forms by published deadlines. Late enrollment and late registration fees may be waived only for the following reasons: student health problems verified by a physician; death in the family; or a verified administrative error on the part of the university.

### Fee Exemptions

**Dependents of Veterans** The California Education Code provides for exemption from certain fees at state-owned colleges, universities, and other schools for eligible students who are dependents or spouses of veterans whose death or disability was service connected. Qualifying UCR students are eligible for exemption from the Student Services Fee, tuition, and Professional Degree Supplemental Tuition. Claims for fee exemptions must be presented to the university during the academic year for which the claim applies. Retroactive approval can be granted only in situations in which students applied for the exemption in a timely manner but approval was delayed by the U.S. Department of Veterans Affairs processing of an original or reopened service-connected disability compensation or Dependency and Indemnity Compensation claim. Contact Student Special Services, 125 Costo Hall, (951) 827-3861, for information.

## Required Student Fees — Fall Quarter 2011

For detailed information on fees, visit [classes.ucr.edu/fees](http://classes.ucr.edu/fees)

Undergraduate Students	Resident	Nonresident
Student Services Fee	\$ 324.00	\$ 324.00
Tuition	3,740.00	3,740.00
Health Insurance Premium	228.00	228.00
Recreation Center Fee	59.00	59.00
Division I Fee	35.00	35.00
Student Center Fee	110.00	110.00
ASUCR Fee	12.50	12.50
ASPB Fee	10.00	10.00
UCR Student Services Fee	6.00	6.00
KUCR Fee	3.00	3.00
Highlander Fee	2.00	2.00
EOP Fee	1.50	1.50
Student Voice Initiative	1.33	1.33
UC Student Association Fee	.75	.75
Green Campus Action Plan	2.50	2.50
<b>Total—California Residents</b>	<b>\$4,535.58</b>	

Nonresident supplemental tuition

7,626.00

**Total—Nonresidents**

**\$12,161.58**

Graduate Students	Resident	Nonresident
Student Services Fee	\$ 324.00	\$ 324.00
Tuition	3,740.00	3,740.00
Graduate and Professional Student		
Health Insurance Premium	588.00	588.00
Recreation Center Fee	59.00	59.00
Student Center Fee	110.00	110.00
Graduate Student Association Fee	13.13	13.13
Graduate Student Association		
Conference Travel	10.00	10.00
Graduate Student Association		
(GASUCR) Fee Fellowship	1.05	1.05
UCR Student Services Fee	6.00	6.00
<b>Total—California Residents</b>	<b>\$4,851.18</b>	

Nonresident supplemental tuition

5,034.00

**Total—Nonresidents**

**\$9,885.18**

**Note** Resident students in M.B.A. and medical school programs pay Professional Degree Supplemental Tuition. Visit [classes.ucr.edu/fees](http://classes.ucr.edu/fees) for more information. Additional mandatory fees such as the Professional Degree Supplemental Tuition and the Medical School Disability Insurance Fee are assessed to all medical school students.

Totals do not include the Technology Course Materials Fee of \$2.00 per unit for graduate students and \$4.00 per unit for undergraduate students.

The amounts shown in this document represent fees as currently approved.

However, all University fees are subject to change, and the fee amounts billed for this period may be adjusted at a future date.

**Exemption from Nonresident Supplemental Tuition** Some students may be eligible for exemption from nonresident supplemental tuition.

Visit <http://registrar.ucr.edu/QuickLinks/Residency.htm> for information.

### Fee Reductions

**Employees** A regular status employee who meets the admission requirements of the university is eligible for a two-thirds reduction of both the Student Services Fee and tuition for up to 9 units or three regular-session university courses per quarter or semester, whichever is greater. An employee so registered is ineligible for the services and facilities of the counseling center, gymnasiums, or the student health services, other than those to which the employee may be otherwise entitled.

**Doctoral Students Advanced to Candidacy** Students who are considered nonresidents for tuition purposes and are advanced to candidacy for the Ph.D. as of the first day of Fall 2006 receive a reduction of 100% of the nonresident supplemental tuition. Students are eligible for a maximum of three calendar years. Time spent not registered (withdrawn, on leave, or on filing fee status) counts toward the three-year total unless the graduate dean grants an exception. Students must be advanced by the first day of the academic term to qualify for that term. Students who are currently advanced will qualify for the reduction if they have not been advanced for more than three years. For example, if a student advanced prior to the first day of the Fall 2008 term, the student will be qualified for the reduction for 2008-09, 2009-2010, and 2010-2011. If not finished by Spring 2011, the student will be required to pay full fees beginning Fall 2011.

## Deferred Payment Plan

The Deferred Payment Plan (DPP) offers students an opportunity to pay their quarterly fees and tuition in three monthly installments. For each quarter of participation, a new application must be submitted on Growl, at [rweb.ucr.edu](http://rweb.ucr.edu), with a processing fee of \$25. Visit [www.sbs.ucr.edu/students/deferred\\_payment\\_plan.html](http://www.sbs.ucr.edu/students/deferred_payment_plan.html) for more information.

## Refunds

### Schedule of Refunds

Days	New Students Receiving Federal Financial Aid	All Other Students
	Percentage Refunded	
Before first day of instruction	100	100
1st day of instruction	100	100
2-7	90	90
8-14	80	50
15-18	70	50
19-21	70	25
22-28	60	25
29-35	50	25
36-42	40	0
43 or more	0	0

Students who withdraw before the end of a quarter may be eligible to receive refunds for some fees. A withdrawal petition must be obtained from [myforms.ucr.edu](http://myforms.ucr.edu) or from the Graduate Division. In accordance with federal regulations, refunds to financial aid recipients are first applied to repayment of aid disbursed.

The effective date for determining a refund of fees is the date the student files an official notice of withdrawal with the university. It is presumed that no university services will be provided to the student after that date.

Beginning the second day of instruction, the Student Services Fee, tuition, student-assessed fees, Professional Degree Supplemental Tuition, and nonresident supplemental tuition are refunded on a prorated basis.

Refunds for health insurance vary. Consult the Campus Health Center, Veitch Student Center, (951) 827-5683.

The Medical School Disability Insurance Fee is not refunded unless the student requests a prorated refund when withdrawing from UCR. Consult the Biomedical Sciences Program counselor at (951) 827-4333 for information about the refund of insurance benefits after withdrawal.

For details concerning fees and fee refunds, consult Student Fees and Deposits — 2011–2012 at <http://budget.ucop.edu/fees/>.

## Refunds for New Students Receiving Federal Financial Aid

Fee refunds for new students receiving Title IV federal financial aid are as follows:

**Prior To and Including Day 1** Prior to and including the first day of instruction, the Student Services Fee is refunded except for the \$100 Statement of Intent to Register deposit paid by undergraduates. Other eligible fees paid are refunded in full.

**Day 2 and After** Beginning the second day of instruction, the Student Services Fee is refunded on a prorated basis except for the \$100 Statement of Intent to Register deposit. Refunds of other eligible fees are prorated as shown in the Schedule of Refunds table in this section.

New students receiving Title IV federal financial aid who withdraw during their first quarter at UCR receive a prorated refund if they withdraw by the end of the sixth week of the quarter.

## Refunds for All Other Students

Refunds for all continuing and readmitted students are as follows:

**Prior To and Including Day 1** Prior to and including the first day of instruction, eligible fees paid are refunded in full.

**Day 2 and After** Beginning the second day of instruction, a prorated refund is given for eligible fees paid.

If students withdraw during a quarter, federal regulations require UCR to calculate the amount of federal financial aid that has been “earned” for the period they attended. If they withdraw before completing 60 percent of the quarter, a *pro rata* portion of the aid must be returned to the federal government. Any portion of unearned aid that must be returned to federal aid programs by UCR will be deducted from the amount of the tuition and fee and/or housing refund. If the amount UCR must return to federal aid programs exceeds the amount of the student’s institutional refund, the student’s account may be billed. More information regarding the return of Title IV federal aid requirements is available at [www.finaid.ucr.edu](http://www.finaid.ucr.edu).

## Distribution Formula for Institutional Refunds

If a Housing or Registration refund is due to a student under UCR’s refund policy and the student received financial aid under any aid program other than Federal Work-Study, the refund shall be returned to student assistance programs in the following order: outstanding balances on Federal Direct Unsubsidized Stafford Loan, Federal Direct Stafford Loan, Federal Perkins Loan, Federal Direct PLUS Loan, Federal Pell Grant, Federal Academic Competitiveness Grant (ACG), National Science and Mathematics Access to Retain Talent (SMART) Grant, Federal Supplemental Educational Opportunity Grant, Cal Grant A or B, UC Student Loan, Grant-in-Aid State, other institutional grants or scholarships. The portion of a refund allocated to a program may not exceed the amount a student received from that program.

## Financial Support

Financial Aid Office  
2106 Student Services Building  
(951) 827-3878; [finaid@ucr.edu](mailto:finaid@ucr.edu); [www.finaid.ucr.edu](http://www.finaid.ucr.edu)

The Financial Aid Office assists students with meeting educational expenses that cannot be met from personal resources. To obtain financial aid students must file the *Free Application for Federal Student Aid (FAFSA)* with the Financial Aid Office yearly. *FAFSAs* are available online beginning January 1 for the upcoming academic year at [www.fafsa.ed.gov](http://www.fafsa.ed.gov). See chart for deadlines for financial aid.

## Financial Aid Deadlines

Students submit <i>FAFSA</i> for the upcoming year	March 2
New Cal Grant applicants submit <i>GPA Verification Form</i> to California Aid Commission	March 2
Scholarships	
Continuing undergraduates submit <i>UCR Continuing Student Undergraduate Scholarship Application</i>	March 1
Entering students apply with the <i>Application for Undergraduate Admission and Scholarships</i>	November 30

Students applying for other grants, loans, and work-study should apply as early as possible. Applications are accepted year-round, with awards to late applicants based on fund availability. Funding cannot be guaranteed to students whose *FAFSAs* are submitted after March 2.

An analysis of the *FAFSA* is required to determine the amount that a student's parents, the student, and/or the student's spouse can be expected to contribute toward the cost of the student's education. The university expects the student and parent (if the student is dependent), or spouse (if the student is married), to contribute toward the educational costs to every extent possible. In addition to filing the *FAFSA*, applicants for financial aid may also be required to submit supporting materials (such as income tax returns) that the Financial Aid Office uses to determine each student's financial need.

All undergraduate financial aid applicants must also apply for California State Grants (Cal Grant A and/or B) by completing the *FAFSA* and *GPA Verification Form* and submitting them by the March 2 filing deadline. If the California Student Aid Commission determines that a student is ineligible for a Cal Grant A or B award, the grant may be replaced with a Federal Direct Stafford Loan in the financial aid package from UCR.

International students are expected to have the necessary funds to cover their entire period of study. The Financial Aid Office does not have funds available to offer assistance to international students. Assistance is not available to students on "limited" status or to those enrolled in UCR Extension. An exception is made for students admitted on "limited" status who must take required prerequisite course work for full admission into the Graduate Division. Students who fall into this category must submit documentation from the Graduate Admissions Office confirming that they are taking prerequisite course work for graduate admission.

For information on graduate student support, see Financial Support under Graduate Studies in this catalog.

## Grants, Loans, Employment, and Scholarships

Students who receive financial aid may receive funds from one or more of the following sources: grants, loans, employment, and scholarships. These sources are described briefly in the following sections; more detailed information regarding eligibility criteria, fund disbursement rules, and enrollment requirements can be obtained from the Financial Aid Office and on the financial aid website at [www.finaid.ucr.edu](http://www.finaid.ucr.edu).

### Grants

The **Federal Pell Grant** program is federally funded and may provide awards up to a maximum of \$5,550 for the academic year. To be eligible, an applicant must be a U.S. citizen or eligible noncitizen, must be enrolled as an undergraduate, and must not have previously received a bachelor's degree. An exception is available for eligible students enrolled in the teaching credential program in the Graduate School of Education. Students apply for the Pell Grant on the *FAFSA*.

**Federal Supplemental Education Opportunity Grants** are federally funded, need-based grants available only to U.S. citizens and eligible noncitizen undergraduate students who have not previously received a bachelor's degree. The grants range from \$100 to \$4,000 per year.

**The State of California—Cal Grant A and B Program** The Cal Grant A program provides awards ranging from \$100 to \$11,124 for the academic year. To be eligible, new applicants must be California residents. Awards are based on academic achievement and financial need. The Cal Grant B program provides awards ranging from \$100 to \$12,675. To be eligible, applicants must be California residents and must demonstrate financial need. The awards are for students from disadvantaged families.

**UCR Grant** awards are offered to undergraduates with the greatest financial need whenever guidelines and funding levels permit.

### Loans

Normally, one or more types of loans are included in each combination of aid offered to a student. Borrowers must be aware of their repayment obligations.

**Federal Direct Stafford Loans** are available to both undergraduate and graduate students who are U.S. citizens or eligible noncitizens. The maximum amount that may be borrowed under this program is \$3500 per year for students in their first year of undergraduate study (0–44 quarter units), \$4,500 per year for the second year of undergraduate study (45–89 quarter units), and \$5,500 per year after reaching junior status (90 or more quarter units), up to an aggregate undergraduate maximum of \$23,000. Graduate students may borrow up to \$8,500 per year up to an aggregate maximum of \$65,500 for combined undergraduate and graduate borrowing. Teaching credential students are limited to the \$5,500 annual maximum for fifth year undergraduate students according to federal regulations.

In addition to these amounts, under the **Federal Direct Unsubsidized Stafford Loan Program** dependent students may borrow up to \$2,000 per year, and independent students may borrow \$6,000 for the first or second year of undergraduate study (0–89 quarter units), or \$7,000 for the third or fourth year of undergraduate study (90 or more quarter units), or \$7000 for teaching credential study, and \$12,000 for graduate study. Interest on a Federal Direct Unsubsidized Stafford Loan accrues immediately and must be paid while in school or added back to the principal amount borrowed.

Dependent undergraduate students may borrow an aggregate of \$31,000 in combined Federal Direct Subsidized and Unsubsidized Stafford Loans, of which no more than \$23,000 can be from Subsidized Stafford Loans. Independent undergraduate and teaching credential students may borrow an aggregate of \$57,500 in combined Federal Direct Subsidized and Unsubsidized Stafford loans of which no more than \$23,000 can be from Subsidized Stafford Loans, and graduate students may borrow a combined aggregate maximum of \$138,500, including undergraduate borrowing, of which no more than \$65,500 can be from Subsidized Stafford Loans.

An origination fee of 1.5% percent is deducted from the amount of the loan prior to disbursement. The interest rate for new loans is a fixed rate of 3.4% on Subsidized Stafford Loans and 6.8% on Unsubsidized Stafford Loans. Minimum monthly repayment of \$50 per month begins 6 months after students cease to be enrolled at least half-time. Borrowers can choose a repayment plan based on their financial circumstances with repayment periods ranging from up to 10 years for standard fixed monthly repayment, to up to a period of 12 to 30 years under alternate repayment options. Information on repayment plans is available at <http://www.ed.gov/offices/OSFAP/DirectLoan/RepayCalc/dlindex2.html>.

**Federal Perkins Loans** are available to undergraduate students. These loans are awarded to students who are U.S. citizens or eligible noncitizens. The amount a student may borrow is determined by financial need but may not exceed \$4,000 per year and \$20,000 for undergraduates. Repayment may be extended over a 10-year period. Interest is 5 percent on the unpaid balance, beginning 6 months after students cease to be enrolled at least half-time.

**University Loans** A limited number of University Loans are available to undergraduate students for up to \$5,500. Awards are made subject to the availability of funds. The amount a student may borrow is determined by financial need. Interest is 5 percent on the unpaid balance; repayment

may be made over a period of not more than 10 years, beginning 6 months after the date on which the borrower ceases to be enrolled at least half-time. Co-signatures are required.

**Emergency Student Loan Fund** In addition to the long-term loans from financial aid programs mentioned above, UCR has an emergency student loan fund. This loan, which does not bear interest, is of a short-term nature to cover emergency needs of up to \$500. Students may borrow up to three times a year.

## Employment

Federal Work-Study is awarded to students with demonstrated financial need. Work-study awards enable students to reduce the amount of loan indebtedness they may incur while attending the university.

Various work opportunities are available through the UCR Career Center, online at [www.careers.ucr.edu](http://www.careers.ucr.edu), in either on-campus or off-campus jobs at nonprofit and community services agencies.

## Scholarships

Scholarship awards are based on a student's academic achievements and, except for honorary scholarships, on need. Scholarships are considered gift assistance.

Most scholarships available through the Financial Aid Office are based on financial need. Other undergraduate scholarships are offered to entering and continuing undergraduates who show evidence of high scholastic attainment. Applicants must meet all priority deadlines for consideration. Non-need based scholarship awards, including Alumni Scholarships, are available to undergraduate students. Financial need is not required. Awards range from \$100 to \$5,000.

**Chancellor's Scholarship**, an award offered to incoming freshmen with a distinguished high school academic record. The scholarship provides an honorarium applied toward student fees. More information regarding the terms of the scholarship award and the amount of the honorarium are available on the Chancellor's Scholarship Terms that the recipient accepts on MyUCR when offered this award.

**Regents Scholarship**, one of the highest honors conferred upon UC students, is awarded on the basis of academic excellence and exceptional promise, without reference to financial need. Students are eligible upon graduation from high school. The appointments run for four years for students entering from high school. Regents Scholars receive an honorarium each year of appointment.

**Chancellor's Performance Awards** Information on Chancellor's Performance Awards may be obtained from the departments of Art, Creative Writing, Dance, Music, and Theatre.

**Engineering Scholarships** Information on scholarships in Engineering may be obtained from the Bourns College of Engineering Student Affairs Office.

**Natural and Agricultural Scholarships** Information on scholarships in the natural and agricultural sciences may be obtained from the College of Natural and Agricultural Sciences Student Affairs Office.

**Departmental Scholarships** Some scholarships are available through academic departments. For more information, students should contact their department.

**Graduate Fellowships and Assistantships** For information on graduate fellowships and assistantships refer to the Graduate Studies section of this catalog or contact the Graduate Division.

**Undergraduate Research Grants** As a research university UCR encourages the tradition of student and faculty engagement in research. UCR provides grant support for students to deepen their knowledge and skills in cutting edge research, field work, and other creative activities under the close guidance of a faculty mentor. Student travel for the purpose of presenting research work at a scholarly conference is also supported through these funds. Grants are available on a quarterly basis. All awards support the costs of conducting a project and cannot be used as a student salary or scholarship aid. Student grant proposals may be initiated directly by students after approaching a faculty member for sponsorship or by faculty

suggesting projects to undergraduates. For details on grant opportunities visit the Office of Instructional Development Web site, at [www.oid.ucr.edu](http://www.oid.ucr.edu).

More information regarding scholarship opportunities available to UCR students is available at <http://www.scholarships.ucr.edu/>.

# Registration and Enrollment

Official registration consists of two steps.

1. Enrollment in classes
2. Payment of fees

Except where noted, the following information applies to both undergraduate and graduate students. Additional information concerning enrollment and academic policies applying only to graduate students is in the Graduate Studies section of this catalog. The Web site [classes.ucr.edu](http://classes.ucr.edu) provides detailed information on registration and enrollment, including details about the following:

- Academic Calendar
- Classes, class hours and locations, and instructors
- Changing the class schedule
- Fees and paying fees
- Final exams
- Grades
- Graduation

Most enrollment and payment functions can be performed at [rweb.ucr.edu](http://rweb.ucr.edu).

**See also information on Expected Progress.**

## Part-Time Study

**Undergraduates** Part-time study (less than 12 units) is available to undergraduate students who find it difficult to enroll full time because of health problems, family and home responsibilities, or occupational and financial need. Students undertaking an approved course load of 10 units or fewer in any quarter shall pay the full Student Services Fee, one-half tuition and one-half nonresident supplemental tuition (if applicable) for that quarter. Students considering part-time study should discuss their plans with the associate dean of their college, whose approval is required.

**Graduates** In some programs, half-time study is possible for graduate students who for reasons of occupation (i.e., full-time employment), unusual family responsibilities, or health reasons are not able to attend full time. A half-time student may not enroll for more than 6 units at any level. Graduate students who are approved for this program receive a refund of one-half of the tuition, one-half of the nonresident supplemental tuition (if applicable), and one-half of the Professional Degree Supplemental Tuition (if applicable). For further details and an application, contact the Graduate Division.

## Concurrent Enrollment Programs

UCR credit for any course taken at another college institution (including UCR Extension) while the student is in residence at UCR is called credit from concurrent enrollment. Credit is normally awarded only under unusual circumstances or through the Cross Registration Program described below during the regular academic year and only with prior approval of the associate dean of the UCR college in which the student is enrolled.

UCR Extension students taking regular-session UCR courses through concurrent enrollment may receive grade points as well as unit credit (effective Spring 1999) should they continue in or be subsequently admitted or readmitted to regular UCR student status. A transcript of the work must be submitted to the Office of Undergraduate Admissions.

Courses taken elsewhere during the summer by a UCR student do not require that the student be under extraordinary circumstances, but they do require prior approval to receive UCR credit even if the student is not in residence at UCR during that summer.

Regular Summer Sessions courses taken at UCR are credited automatically to the UCR academic record of any student enrolled in the regular academic year. A UCR student may request unit credit toward graduation for courses taken in summer session at other UC campuses by submitting a transcript of the work to the Office of Undergraduate Admissions.

**Cross Enrollment** The California Education Code Sections 66750 through 66756, commonly referred to as Senate Bill 1914 (Killea), permits undergraduate students enrolled in any campus of the California Community Colleges, the California State University, or the UC to enroll without formal admission in a maximum of one course per academic term at a campus of either of the other systems on a space-available basis at the discretion of the appropriate campus authorities on both campuses. At UC campuses, the beginning of the third week of instruction has been designated as the date by which an instructor can determine when space is available to accommodate a student seeking to enroll on this basis. (Normally, instructors in all segments permit students to attend classes until their final course registration has been certified.) Cross enrollment at another campus within the same system is excluded, as is enrollment in precollegiate courses. Students who seek to cross enroll under this program must have met all of the following requirements:

1. Completed at least one term at their home campus as a matriculated student
2. Enrolled for a minimum of six units at their home campus for the current term
3. Earned a cumulative grade point average of 2.00
4. Paid appropriate fees and any applicable tuition at their home campus for the current term
5. Completed appropriate academic preparation for the desired course, as determined by the host campus, consistent with the standards applied to regularly enrolled students

6. Have been classified as a California resident by their home campus  
Both schools must be participating in this program before a student can take a course at another institution for the \$24 per unit cross enrollment fee. Additional information and cross enrollment application forms are available at the Office of the Registrar.

**Cross Registration** The Cross Registration Program allows a full-time UCR undergraduate student who has officially declared a major and who is in good academic standing to enroll simultaneously at California State University, San Bernardino for no more than one course per quarter. The program is designed for students to take classes not available at UCR. (This program is not available during Summer Session.) Approvals are required from the student's academic advisor, college dean, and the Registrar. Application forms and deadline information may be obtained from the Office of the Registrar.

**Simultaneous Enrollment** Undergraduate students may enroll, without formal admission and without payment of additional university fees, in courses at another UC campus on a space-available basis at the discretion of the appropriate campus authorities on both campuses.

A student is qualified for simultaneous enrollment if the student has met all of the following requirements:

1. Completed a minimum of 12 units as a matriculated student at the home campus
  2. Enrolled for a minimum of 6 units for the current term at the home campus
  3. Is in good standing
  4. Has the appropriate academic preparation as determined by the host campus
- Additional information and simultaneous enrollment application forms are available at the Office of the Registrar.

## Intercampus Visitor Program

The Intercampus Visitor Program enables qualified undergraduates at the UC to take advantage of educational opportunities at other UC campuses. Under this program, students may take courses that are not available on their home campus, participate in special programs, or study with a distinguished faculty member at another campus. Participants may enroll at another campus for only one term. Additional information on requirements and application forms can be obtained at the Office of the Registrar.

## Withdrawals and Leaves of Absence

Undergraduate students who wish to terminate work in the university during a current quarter, officially and without scholarship penalty, must initiate an application for withdrawal in the office of the dean of the student's college. The student must settle all accounts and return any university property such as books, keys, laboratory equipment, and uniforms. After the first few weeks of the quarter, such petitions are granted only under exceptional circumstances.

Students who withdraw are no longer considered continuing students. Students wishing to return to the university must apply for readmission at least six weeks before the beginning of the quarter to be sure of registration without late fees. Visit [classes.ucr.edu](http://classes.ucr.edu) for deadline information.

Students who withdraw from the university without authorization may receive grades of "F" in all courses in which they are enrolled. Further, the Special Services Office is required to notify the Department of Veterans Affairs when any student fails, receives no credit, or withdraws from all subjects undertaken.

**The Planned Educational Leave Program (PELP)** is for undergraduate students who want to interrupt their regular education for one year or less while clarifying educational goals, gaining practical experience away from campus, or enhancing the prospect of successful completion of an academic program. Students must have completed at least one quarter of course work at UCR and be in good academic standing to qualify. Students holding F-1 visas cannot participate in this program. Information on PELP is available from the dean of the student's college, the Counseling Center, and the Office of the Registrar.

**The Planned University Leave Program (PULP)** is designed for undergraduate students who plan to interrupt their education at the UC to study at another academic institution. A student planning to attend a postsecondary institution in the United States should consult the dean's office of the student's college.

Graduate students who wish to withdraw or apply for a leave of absence should contact the Graduate Division.

**Planned Opportunities Abroad Agreement (POAA)** permits UCR students to study abroad on a non-UC program and return to UCR without having to file for readmission. POAA advising and applications are available at the International Education Center, University Village, Suite 204.

[www.internationalcenter.ucr.edu](http://www.internationalcenter.ucr.edu).

## Readmission

Undergraduate students who wish to return to UCR must file an application for readmission with their college Student Academic Affairs office at least six weeks prior to the quarter of proposed registration. Visit [classes.ucr.edu](http://classes.ucr.edu) for deadline information. A nonrefundable application fee of \$60 is charged. Approval of the dean of the student's college or division is required for readmission. Students dismissed or not in good standing may be required to meet with the appropriate dean. Readmission of students disqualified for disciplinary purposes is subject to approval of the Dean of Students.

Transcripts from other institutions (including University Extension) attended during a student's absence must be filed with the Undergraduate Admissions Office at least six weeks prior to the quarter of readmission. Students who were not registered during the fall, winter, or spring quarter immediately prior to their expected graduation must file an application for readmission with their college Student Academic Affairs office.

Graduate students desiring readmission or termination of leaves of absence should contact the Graduate Division.

## Student Records and Transcripts

The Office of the Registrar prepares and permanently retains records of students' academic work at UCR for regular sessions and summer sessions. It maintains separate academic records for undergraduate, professional, and graduate careers. The academic record chronologically lists courses, units, grades, cumulative GPA, transfer credits, and total units.

Students may order copies of their transcript at Growl (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)). Otherwise, the transcript of a student's UCR academic record is released only upon receipt of a signed request by the student authorizing its release. Application may be made in person at the Office of the Registrar, or by mail; telephone requests cannot be honored. Students

can order transcripts for regular (\$10 fee for each official transcript) or rush service. Application should be made two weeks in advance of the time the transcript is needed. Rush service for the transcript is available within 24 hours of receipt of the application; the fee is \$10 per transcript plus a \$10 service fee.

Express mail service is available for an additional \$17.40. Fax service is available at \$2 per page plus the aforementioned charges as appropriate. Payment is due in advance for all transcript service. A check or money order payable to Regents UC should be submitted with the application for transcript. All outstanding debts to the university (with the exception of long-term financial aid loans not yet due and payable) must be paid in full before a transcript will be released.

Students are strongly advised to check their academic records carefully and to bring any discrepancies to the attention of the Office of the Registrar immediately. Supporting enrollment documents are retained for no more than one year. After one year, it is assumed that students accept the accuracy of their academic records. Once a degree has been posted, changes to a student's academic record are allowed only to correct an administrative error.

## Disclosure of Student Records

In accordance with the Federal Family Educational Rights and Privacy Act (FERPA) of 1974 as amended, and campus procedures that implement the University of California Policies Applying to the Disclosure of Information from Student Records, the following information is published.

Students' academic records are maintained in their academic department and appropriate college or school or the Graduate Division; the maintenance of these records is the responsibility of the department chair or dean. Students who believe that their records contain incorrect or misleading information and who seek review of these records with a view toward altering or expunging a portion of them should make initial inquiry and petition through the appropriate department chair or academic dean, who institutes an informal investigation and, if necessary, refers the matter for hearing.

**Office of the Registrar** Student records maintained by this office include the official UCR academic record (transcript), academically-related information, and the residence classification information. The maintenance of these records is the responsibility of the Registrar. These records are available only to officials and employees of the University of California who need access to them for the performance of their official duties or to bona fide agents of the university for the collection of overdue debts to the university (but only as may be necessary to ensure collection of the overdue debt). Students who believe that their records contain incorrect or misleading information and who seek review of those records with a view toward altering or expunging a portion of them should make initial inquiry and petition through the Registrar, who institutes an informal investigation and, if necessary, refers the matter for hearing. Students may inspect records, maintained by the campus, of disclosures of personally identifiable information from their student records.

**Office of Undergraduate Admissions** Records are maintained by this office for every undergraduate student who attended UCR with the exception of students enrolled exclusively in University Extension or Summer Sessions. These files containing the original admission application, transcripts from institutions previously attended, and other documents related to applications for admission are held for five years after the last date of attendance or until graduation (whichever occurs earlier) at which time they are purged. Maintenance of these records is the responsibility of the Director of Undergraduate Admissions.

**Office of Financial Aid** Records maintained by this office are relevant to financial aid awards, work-study employment, and academic information as it pertains to satisfactory academic progress standards. These records include, but are not limited to, the *Free Application for Federal Student Aid (FAFSA)*, Federal Income Tax Forms (1040, 1040A, 1040EZ), Financial Aid Transcripts (FAT) from schools previously attended, the Verification Form, and student employment forms. Maintenance of these records is the responsibility of the Director of Financial Aid.

Students who have records in various student service offices such as Career Services, Counseling Center, Health Service, Housing, International Education Center, Learning Center, Student Special Services (for disabled and veterans'

services), and Women's Resource Center should contact those offices for information. Student discipline records are kept in the office of Student Conduct & Academic Integrity Programs.

The University of California, Riverside considers the following to be public information with respect to individual students: name; addresses (local, permanent, e-mail); telephone numbers; date and place of birth; major field of study; dates of attendance; degrees and honors received; the name of the most recent previous educational institution attended; participation in officially recognized university activities, including intercollegiate athletics; and the name, weight, and height of participants on intercollegiate university athletic teams.

Students have a right to refuse to permit any or all of the above categories of personally identifiable information to be designated as public information with respect to themselves. Students who do not want their information to be published in the campus directory must check the appropriate privacy restriction on Growl (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)). Students who wish to have any or all of the items defined as public information to be restricted from release outside the university must check each item to be restricted on Growl.

Students who choose to restrict personally identifiable information about themselves that has been defined as public information are advised of some potential implications. The campus may not then disclose to anyone (including prospective employers, hometown newspapers, and others outside the university) information from a restricted category, such as the award of a Regents Scholarship, election to Phi Beta Kappa, degree(s) granted and the date(s) conferred, and dates of attendance.

Copies of the University of California and UCR Policies Applying to Disclosure of Information from Student Records are available in the following offices on the UCR campus: Office of the Executive Vice Chancellor and Provost; Office of the Registrar; Office of the Vice Chancellor, Student Affairs; and Office of the Ombudsman. These offices also have copies of the Federal Family Educational Rights and Privacy Act of 1974, as amended, for review.

Students have a right to file complaints with the Family Policy Compliance Office, U.S. Department of Education regarding alleged violations of the rights accorded them by the Family Educational Rights and Privacy Act of 1974, as amended. Students are urged to bring to the attention of the UCR Ombudsman any problems or possible violations of rights associated with the Act.

## Residence for Tuition Purposes

Students who have not been living in California with the intent to make it their permanent home for more than one year immediately before the residence determination date for each term in which they propose to attend the university must pay nonresident supplemental tuition as well as all assessed fees. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter. For schools on the semester system, the residence determination date is the day instruction begins for the semester.

**Law Governing Residence** The rules regarding residence for tuition purposes at the University of California are governed by the California Education Code and implemented by Standing Orders of the Regents of the University of California. Under these rules, adult citizens and certain classes of aliens can establish residence for tuition purposes. There are particular rules that apply to the residence classification of minors (see below).

**Who is a Resident?** If you are an adult student (at least 18 years of age), you may establish residence for tuition purposes in California if you are a U.S. citizen, or a permanent resident or other immigrant, or if you are a nonimmigrant who is not precluded from establishing a domicile in the United States. Check with the residence affairs officer in the Office of the Registrar for the latest information on qualifying nonimmigrant visas.

To establish residence, you must be physically present in California for more than one year prior to the residence determination date, and you must have come here with the intent to make California your home as opposed to coming to California to go to school.

Physical presence in the state solely for educational purposes does not constitute the establishment of California residence, regardless of the length of your stay.

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You must demonstrate your intention to make California your home by severing your residential ties with your former state of residence and by establishing those ties with California. If these steps are delayed, the one-year physical presence requirement will be extended until you have demonstrated both presence and intent for one full year.

If your parents are not residents of California, you will be required to be financially independent to qualify as a resident for tuition purposes.

**Requirements for Financial Independence** You are considered “financially independent” if one or more of the following apply: (1) you are at least 24 years of age by December 31 of the calendar year for which you are requesting residence classification; (2) you are a veteran of the U.S. Armed Forces; (3) you are a ward of the court or both parents are deceased; (4) you have legal dependents other than a spouse; (5) you are married or a registered domestic partner, or are a graduate or professional student, and you were not claimed as an income tax deduction by your parents or any other individual for the tax year immediately preceding the term for which you are requesting resident classification; or (6) you are a single undergraduate student and were not claimed as an income tax deduction by your parents or any other individual for the two tax years immediately preceding the term for which you are requesting resident classification and you can demonstrate self-sufficiency for those two years. (Note that financial dependence is not a factor in residence status for graduate student instructors, graduate student teaching assistants, research assistants, junior specialists, postgraduate researchers, graduate student researchers, and teaching associates who are employed 49 percent or more of full-time in the term for which classification is sought.)

**Establishing Intent to Become a California Resident** Indications of your intent to make California your permanent residence can include the following: registering to vote and voting in California elections; designating California as your permanent address on all school and employment records, including military records if you are in the military service; obtaining a California driver’s license or, if you do not drive, a California identification card; obtaining California vehicle registration; paying California income taxes as a resident, including taxes on income earned outside California from the date you establish residence; establishing a California residence in which you keep your personal belongings; and licensing for professional practice in California. The absence of these indicia in other states during any period for which you claim residence can also serve as an indication of your intent. Documentary evidence is required, and all relevant indications will be considered in determining your classification. Your intent will be questioned if you return to your prior state of residence when the university is not in session.

**General Rules Applying to Minors** If you are an unmarried minor (under age 18), your residence is considered to be the residence of the parent with whom you live. If you have a parent living, you cannot change your residence by your own act, by the appointment of a legal guardian, or by the relinquishment of your parent’s right of control. If you live with neither parent, your residence is that of the parent with whom you last lived. Unless you are a minor alien present in the United States under the terms of a nonimmigrant visa that precludes you from establishing domicile in the United States, you may establish your own residence when both your parents are deceased and a legal guardian has not been appointed. If you derive California residence from a parent, that parent must satisfy the one-year durational residence requirement.

### Specific Rules Applying to Minors

**Divorced or Separated Parents** You may be able to derive California resident status from a California resident parent if you move to California to live with that parent on or before your 18th birthday.

**Parent of Minor Moves from California** You may be entitled to resident status if you are a minor U.S. citizen or eligible alien whose parent(s) was a resident of California who left the state within one year of the residence determination date if

- (a) you remained in California after the departure of your parent(s);
- (b) you enroll in a California public postsecondary institution within one year of the departure of your parent(s); and
- (c) once enrolled, you maintain continuous attendance in that institution. Financial independence is not required in this case.

**Two-Year Care and Control** You may be entitled to resident status if you are a U.S. citizen or eligible alien and you have lived continuously with an adult who is not your parent for at least two years prior to the residence determination date. The adult with whom you are living must have been responsible for your care and control for the entire two-year period and must have been living in California during the one year immediately preceding the residence determination date.

**Students Who May Be Exempt from Nonresident Supplemental Tuition** Visit [registrar.ucr.edu/Quicklinks/residency.htm](http://registrar.ucr.edu/Quicklinks/residency.htm) for information on exemptions.

**Temporary Absences** If you are a nonresident student who is in the process of establishing a residence for tuition purposes and you return to your former state during noninstructional periods, your presence in California will be presumed to be solely for educational purposes, and only convincing evidence to the contrary will rebut this presumption. Students who are in the state solely for educational purposes will not be classified as residents for tuition purposes regardless of the length of their stay.

If you are a student who has been classified as a resident for tuition purposes and you leave the state temporarily, your absence could result in the loss of your California residence. The burden will be on you (or your parents if you are a minor) to verify that you did nothing inconsistent with your claim of a continuing California residence during your absence. Steps that you (or your parents) should take to retain a California residence include

1. Continuing to use a California permanent address in all records.
2. Continuing to satisfy California tax obligations. If you are claiming California residence, you are liable for payment of income taxes on your total income from the date you establish your residence in California, including income earned in another state or country.
3. Retaining your California voter’s registration and vote by absentee ballot.
4. Maintaining a California driver’s license and vehicle registration. If it is necessary to change your driver’s license or vehicle registration, you must change them back within the time prescribed by law.

**Petition for Resident Classification** You must petition in person at the Office of the Registrar, 2249 Student Services Building, for a change of classification from nonresident to resident status. All changes of status MUST be initiated before the first day of classes for the term for which you intend to be classified as a resident.

**Time Limit on Providing Documentation** If additional documentation is required for residence classification but is not readily accessible, you will be given until the end of the applicable term to provide it. Nonresident supplemental tuition must be paid pending the outcome of the decision.

**Incorrect Classification** If you were classified as a resident incorrectly, you are subject to a nonresident classification and to the payment of all nonresident supplemental tuition not paid. If you concealed information or furnished false information and were classified incorrectly as a result, you may be subject to university discipline. Resident students who become nonresidents must immediately notify the campus residence affairs officer.

**Inquiries and Appeals** Inquiries regarding residence requirements, residence determinations and/or recognized exceptions should be directed to the Residence Affairs Officer, Office of the Registrar, 2249 Student Services Building, University of California, Riverside, Ca. 92521-0118. Students do not have an automatic right to appeal every nonresident determination. University of California Residence Policy permits you to appeal your classification as a nonresident ONLY IF:

1. The decision to classify you as a nonresident for purposes of tuition and fees was based on a significant error of fact, a significant procedural error, or an incorrect application of policy which, if corrected, would require that you be reclassified as a resident.
2. Significant new information became available after the date of the campus decision classifying you as a nonresident; despite the exercise of reasonable diligence (care and attention) the information was not previously known or available to you; and, based on the new information your classification as a nonresident is incorrect.

No appeals based solely upon disagreement with the campus decision will be accepted.

For further information or to obtain the Application to Appeal form please go to [ucop.edu/ogc/guides.html](http://ucop.edu/ogc/guides.html). You would print the Application to Appeal form attach a copy of your campus residence determination, and submit it to the Office of the General Counsel (OGC) at one of the addresses indicated on the form. Do not submit any other documents. Your appeal must be received at OGC within thirty (30) days following the date of the campus decision classifying you as a nonresident. An OGC Residency Analyst will determine whether you have stated appropriate grounds for an appeal. If your appeal is accepted for review, the Residency Analyst will obtain your residence file from the campus and may request documentation from you at that time.

The decision on your appeal is final. You may not file any further appeals of nonresident classification for the term for which you have been declared a nonresident.

Only staff members in the OGC are authorized to explain or provide information regarding UC Residence Policy pertaining to appeals.

You are advised that the foregoing is a summary of the law regarding residence. Regulations adopted by the Regents are available for inspection in the Office of the Registrar. Note that changes may be made in the residence requirements between the publication of this statement and the relevant residence determination date.

**Privacy Notice** All information requested on the Statement of Legal Residence form is required by the authority of Standing Order 110.2 (a)-(d) of the Regents of the University of California for determining whether you are a legal resident for tuition purposes. The residence affairs officer in the Office of the Registrar maintains the requested information. You have the right to inspect university records containing the residence information requested on the form.



**UC Riverside is a large, world class university that has retained its friendly, small college feel.**

# Policies and Regulations

For information on other policies applicable to students, visit [deanofstudents.ucr.edu](http://deanofstudents.ucr.edu).

## Academic Policies

### Catalog Rights Policy for Undergraduate Degrees

Students who enter UCR as freshmen normally follow the catalog in effect in their first year of studies. Transfer students who have completed appropriate transfer programs have prior catalog rights. Check with the college dean's office for more information.

Academic Senate Regulation R6.12 states as follows: To be awarded the bachelor's degree, a student must either (a) meet graduation requirements in the UCR catalog in effect in the year of his/her graduation from the Riverside campus; or (b) fulfill graduation requirements in one UCR catalog applicable during any of the previous four years in which the student successfully completed at least one quarter or one semester of full-time college-level work, regardless of where matriculated. Upon applying for candidacy, the student must specify the applicable catalog.

At UCR, courses are assigned a unit value determined by the number of hours of work per week required of the student. Specifically, Academic Senate regulations require three hours of work per week for each unit of credit. For example, in a 4-unit course scheduled to meet four hours per week, a student is expected to spend eight hours of preparation outside of class.

Grades in courses are assigned as follows:

**Passing** "A" (distinction), "B" (high pass), "C" (pass), "D" (marginal pass). Grade point values per unit are as follows: "A"=4, "B"=3, "C"=2, "D"=1. The grades "A," "B," "C," and "D" may be modified by plus (+) or minus (-) suffixes. Minus grades carry three-tenths grade point less per unit, and plus grades (excluding "A+") carry three-tenths grade point more per unit than unsuffixed grades.

**Not passing** "F" (failure). No grade point value.

**Grade Delay** "GD." Assigned temporarily when grade posting is delayed for administrative reasons. Students who see "GD" on their grade report or transcript should contact their instructor for clarification.

**Incomplete** "I." Units are not charged and grade points are not assigned.

**Withdrawal** "W." Course dropped after the second week of classes. Units are not charged and grade points are not assigned.

The grade point average (GPA) is determined by multiplying each grade point value by the number of units assigned to the course, adding up these grade point units, and dividing the total grade point units by the total number of units for which letter grades are received. The grade point balance, also calculated on the transcript, represents the number of grade point units students have earned above or below the GPA required for their degree objective. In the case of undergraduates, it is a "C" average (2.00); for graduate students, it is a "B" average (3.00).

### Satisfactory/No Credit Grades

A student in good standing may undertake courses on a Satisfactory/No Credit (S/NC) basis subject to the following limitations: the grade "S" is awarded for work satisfactory for unit credit in meeting degree requirements. For undergraduates, the requirement is a "C" average (2.00); for graduate students, it is a "B" average (3.00). Units are assigned for courses graded "S," but "S" has no grade point equivalent and does not enter the GPA. Neither units nor grade points are assigned for an "NC" grade; the grade is recorded on the transcript but does not enter the GPA.

Some graduate and undergraduate courses may, in accordance with regulations, be designated for grading on an S/NC basis only. Graduate courses are letter graded unless the course description specifies otherwise.

In certain preidentified graduate courses, the department may allow a third (residual) category in which a graduate student may elect to take a course on an S/NC basis, provided that the graduate advisor consents. (Graduate students must petition to take undergraduate courses outside their major on an S/NC basis, and they may not take undergraduate courses in their major on an S/NC basis.) Students should consult the Graduate School of Education before electing courses on an S/NC basis to be used for a teaching credential.

Students enrolled in an undergraduate degree program may receive credit for courses undertaken and graded "S" on the UCR campus to a limit of one-third of the total units undertaken and passed on the Riverside campus at the time the degree is awarded. Units completed on another campus of the university by a Riverside undergraduate student enrolled as an intercampus visitor are considered Riverside work for the purposes of this regulation.

Courses required in or prerequisite to the undergraduate student's major subject may be taken on an S/NC basis only on approval of the chair of the student's department (or other primary instructional unit) in each individual case. A student on "limited" status may take courses on an S/NC basis at the discretion of the dean of the school or college in which the student is enrolled. Courses in the X or XR300, X400, or 300 series are not subject to the one-third limitation on courses graded "S." For additional limitations on 300 and 400 series courses, see individual college sections in the Undergraduate Studies section of this catalog.

A student may elect "S/NC" or delete "S/NC" from a course by filing a petition with the Registrar. The deadline is the end of the eighth week of instruction and is listed each quarter at [classes.ucr.edu](http://classes.ucr.edu).

### Incomplete Grades

The grade "I" (incomplete) is a provisional grade which denotes that a student's work was of passing quality but incomplete for good cause. Units attempted are not charged for courses graded "I." The grade of "I" may be replaced if the work is completed as specified by the instructor prior to the end of the following quarter. When a course graded "I" has not been successfully completed after one additional quarter or by the time the student is ready to graduate (whichever is less), it will be replaced by a grade of "F" or by "NC" (if the course were taken on an S/NC basis). The appropriate dean may extend the time for successful completion when he or she considers that circumstances warrant it, provided the request is received before the grade "I" is changed to "F" or "NC."

### In Progress Grades

For certain courses extending over more than one term, where, by consent of the Academic Senate, evaluation of the student's performance may be deferred until the end of the final term, provisional grades of "IP" (in progress) are assigned in the intervening terms.

Neither units nor grade points are assigned for "IP" grades. The provisional grades are replaced by the final grade if the student completes the full sequence. In the event that the full sequence is not completed, the grade "IP" is replaced by the grade "I," and further changes in the student's record are subject to regulations governing the grade "I."

### Workload Credit

Workload credit is given for UCR classes preparatory to regular university work. Workload credit does not carry units for graduation but does count as part of a student's academic course load and enrollment status.

### Repetition of Courses

Repetition of courses not authorized to be taken more than once for credit is subject to the following conditions: generally, a student may repeat only courses in which a grade of "D," "F," or "NC" was received.

In some circumstances, students may repeat a "C-" to satisfy an academic requirement.

For example, in courses taken to meet the Entry Level Writing Requirement, such as ENGL 004 and ENGL 005, students must earn a grade of “C” or higher to satisfy the requirement, so students who receive a grade of “C-” may repeat the course.

Degree credit for a course will be given only once, but the grade assigned at each enrollment shall be permanently recorded. In computing GPA of an undergraduate who repeats courses in which the student received a “D” or an “F,” only the most recently earned grades and grade points shall be used for the first 16 units repeated. In the case of further repetitions, the GPA shall be based on all grades assigned and the total units attempted. Courses in which a grade of “D” or “F” has been earned may not be repeated on an S/NC basis. Repetition of a course more than once requires approval by the appropriate dean in all instances.

Students should be aware that some professional and graduate schools count the grades for all courses, including those repeated, in calculating a student’s GPA. The GPA used by such schools could differ significantly from that shown on a student’s UCR transcript.

The Department of Veterans Affairs will not consider toward full time those units which are a repeat of courses in which a grade of “D-” has been received, unless a higher grade in the course is specifically required for graduation. Contact Student Special Services, (951) 827-3861, for additional details.

## Change of Grade

All grades except “I” and “IP” become final when they are assigned. No term grade may be revised by reexamination. No change of grade may be made on the basis of reassessment of the quality of a student’s work. However, at the discretion of the instructor in charge of a course, reexamination and reassessment of work may be allowable under the terms of the Sanctioning Guidelines of the UCR Academic Integrity Policy. See Academic Integrity later in this section. An instructor may approve and report to the Registrar a correction of a recorded course grade at any time if clerical or procedural error has been made in assigning, transmitting, or recording the original grade.

## Procedures for the Appeal of Grades

The Regulations of the Riverside Division of the Academic Senate state that if a student believes that nonacademic criteria have been used in determining a grade, the student shall attempt to resolve the grievance with the instructor of the course through written appeal to the instructor via the chair of the department. If the grievance is not resolved to the student’s satisfaction at the departmental level, the student may file a complaint with the dean of the college or school having jurisdiction over the course or with the dean of the Graduate Division if the student is in graduate status. The complaint should be filed immediately after the alleged use of nonacademic criteria but no later than six weeks after the beginning of the subsequent quarter. Nonacademic criteria are criteria not directly reflective of class performance, such as discrimination on political grounds or for reasons of race, religion, sex, or ethnic origin or for other arbitrary or personal reasons.

## Expected Progress for Undergraduate Students

**Expected Progress** A full-time undergraduate student is considered to be making Expected Progress toward a baccalaureate degree if he or she:

1. passes at least 45 units each academic year,
2. declares a major by the time the student earns 90 units, and
3. follows a program of study consistent with the requirements of the student’s declared major or undeclared student’s College or School.

**Continued Registration** A full-time undergraduate student is considered ineligible for Continued Registration if he or she:

1. does not pass at least 37 units in each academic year, or
2. does not complete the Expected Progress requirements as stated above.

**Failure to Meet Criteria for Continued Registration** Registration of a full-time undergraduate student who is ineligible for Continued Registration under any of the criteria described above shall be at the discretion of the faculty in the student’s College or School or Associate Dean for Student Academic Affairs in each College or School.

**Units Passed** For purposes of determining eligibility for Continued Registration, in addition to units earned by passing regularly enrolled courses, the following defines what shall be counted as units passed.

1. Workload only, non-credit courses with passing grades shall be counted as units passed.
2. If a student receives a grade of D in a course and then repeats and passes the course, the units from each enrollment shall be counted as units passed during the quarter the course was taken, provided the student has not accumulated more than a total of 16 repeated units.
3. Units earned during a summer session, either at UCR or another accredited school and transferred to UCR, shall be counted as units passed during the academic year immediately preceding the summer session.
4. Units earned during a summer session, either at UCR or another accredited school and transferred to UCR, shall be counted as units passed during the academic year immediately preceding the summer session.
5. Units passed by examination shall be counted as units passed during the quarter in which the examination was taken.
6. Units graded IP (In Progress) shall be counted as units passed.
7. Units graded I (Incomplete) are not counted as units passed. When the grade of I is replaced by a passing grade, the units shall be counted toward Expected Progress for the quarter in which the I grade was awarded.

**Units of Courses Taken at Other Institutions** A student is prohibited from obtaining transfer units for courses taken at a non-University of California campus in a quarter during which the student is enrolled as a full-time student at UCR. Summer session course work is exempt from this restriction.

1. To request an exception, a petition must be submitted to and approved by the appropriate College or School committee or administrative officer prior to the quarter of concurrent enrollment.
2. In those instances where approval has been granted, units earned from courses taken at a non-University of California campus shall be counted toward the Expected Progress in the quarter(s) in which the concurrent enrollment occurred.

## Posthumous Awards

The University of California, Riverside seeks to extend sympathy and compassion to the families of students who pass away near the completion of their degrees and to recognize the academic achievement of students who would have fulfilled the requirements of the degree. These actions must also be balanced with attention to academic and institutional integrity. For more information on identifying and considering candidates for the award of posthumous undergraduate degree, please contact the Office of Student Affairs in the appropriate college.

## Final Examinations

The instructor in charge of an undergraduate course shall be responsible for assigning the final grade in the course. The final grade shall reflect the student’s achievement in the course and shall be based upon adequate evaluation of that achievement. The instructor’s methods of evaluation must be clearly announced during the progress of the course. Evaluation methods must be of reasonable duration and difficulty and in accord with applicable departmental policies. The methods may include a final written examination, a term paper, a final oral examination, a take-home examination, or other evaluation device. If a final written examination is given, it shall not exceed three hours in duration and shall be given only at the time and place announced at [classes.ucr.edu](http://classes.ucr.edu). No student shall be excused from assigned final examinations.

## Backdating Units

Undergraduate students who have no more than two courses or 8 units of course work remaining to be completed in their program for the bachelor's degree at UCR and who have been approved for admission to graduate status may begin the course work for an advanced degree at the beginning of their final quarter of undergraduate study. The student must inform the college office prior to enrollment in course work. When students are registered in graduate status, they then petition for credit for the courses completed beyond those required for a bachelor's degree. The petition must be signed by the dean of the school or college, attesting to the fact that the student's deficiency was as stated, and the petition is subject to approval by the department and the dean of the Graduate Division.

## Credit by Examination

Credit by examination may be earned in accordance with regulations established by each college. The student should consult the Undergraduate Studies section of this catalog for specific regulations.

A UCR student in residence may take examinations for degree credit in courses offered on the campus without formally enrolling in them. The results of the examinations are entered upon the student's record. There is a \$5 service charge for each petition.

## Undergraduate Credit for Graduate Courses

Students interested in obtaining undergraduate credit for graduate courses should contact the office of the dean of their college for further information.

### Class Standing

Classification	Completed Units
Undergraduate	
Freshman	0–44.9
Sophomore	45–89.9
Junior	90–134.9
Senior	135 or more
Limited	
Second Baccalaureate	
Professional	
Credential Programs	
Medical Program	
Graduate	
Master's	
Doctoral 1 (not advanced to candidacy)	
Doctoral 2 (advanced to candidacy)	
Postdoctoral	

Undergraduate classification is determined by the number of quarter units earned. Postbaccalaureate and graduate classifications are based on the student's academic objective and whether or not the student is advanced to candidacy for a doctorate.

## Scholarship Regulations

**Academic Standing** To remain in good academic standing, a student must maintain a GPA of at least 2.00 and make progress toward the degree at a satisfactory rate.

**Academic Probation** Students are placed on academic probation if, at the end of any term, their GPA for the term is less than 2.00 but greater than 1.50, or their cumulative GPA, computed on the total of all courses undertaken in the university, is less than 2.00 ("C" average).

**Academic Disqualification** Students are subject to disqualification from further registration in the university a) if, at the end of any term, their GPA for that term is less than 1.50 or b) if, after two terms on academic probation, their cumulative GPA, computed on the total of all courses undertaken in the university, is less than 2.00 ("C" average).

Students who are subject to the provisions of this regulation are also subject to such supervision as the faculty of their college may determine. The faculty may disqualify a student under its supervision from further registration in the university or, by suspending the provisions of this regulation, may permit a student subject to disqualification to remain in the university.

Undergraduate students who are disqualified are excluded from the university, and their connection with the university is presumed to be ended by such exclusion. Under certain circumstances, disqualified students may be readmitted upon their petition to the college and interview with the dean.

Ordinarily, students are not readmitted until after the lapse of a year and unless their deficiencies are reparable within a reasonable period of time. During the period of disqualification, a student must give evidence of conduct which indicates that improved academic performance can be expected upon readmission. If readmitted, students must remove their deficiencies through above-average work undertaken in the university. It is usually required that all deficiencies be removed during the first year after readmission.

To transfer from one campus of the university to another, or from one college to another on the same campus, students who have been disqualified or who are on probation must obtain the approval of the appropriate dean to whose jurisdiction transfer is sought. Upon completion of the transfer, the students are subject to such supervision as the faculty of their college may determine.

Graduate students must maintain an average of at least three grade points per unit in all upper-division and graduate courses taken for letter grade during residence at the UC. Only courses in which the student is assigned grades "A," "B," or "C," or equivalent, may be counted in satisfaction of the requirements for the master's degree. Graduate students who acquire scholarship deficiencies are subject to action by the dean of the Graduate Division.

## Programs for Outstanding Students

Departments of the colleges offer and administer various courses and honors programs for specially prepared, outstanding students. In some departments, equivalent special studies and seminar programs have been designed for students with special aptitudes. Interested students should consult their faculty advisors early for details of the program in their major department.

## Honors

**Chancellor's Honor List** Students who are placed on the dean's honor list for all three quarters in a single academic year (fall, winter, and spring) are placed on the Chancellor's Honor List for that academic year.

**Dean's Honor List** Any student who in any quarter completes a minimum of 12 units with letter grades, with no grade in any course below a "B" and no grade of "NC" or "I," and who has a GPA of 3.50 or better for all work undertaken in the university for that quarter, is placed on the Dean's Honor List.

**Graduation with Honors** The Academic Senate has established the following standards for award of honors at graduation: No more than the top 2 percent (by GPA) in the June graduating class shall receive highest honors. No more than the next 4 percent of graduating students shall receive high honors, and no more than the next 10 percent shall receive honors. To be eligible for honors at graduation, a student must have completed 60 or more quarter units of graded courses at the UC. The GPAs used to determine class rank shall be based on courses taken at the UC.

Students may obtain a statement of the specific requirements for graduation with honors from the office of the dean of their college.

**University Honors Program** For a description of the University Honors Program, see Educational Opportunities in the front of this catalog. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section of this catalog.

## Academic Integrity

At UCR, honesty and integrity are fundamental values that guide and inform us as individuals and as a community. The culture of academia requires that students take responsibility for learning and for producing products that reflect their intellectual potential, curiosity, and capability. Students must represent themselves truthfully, claim only work that is their own, acknowledge their use of others' words, research results, and ideas, using the methods accepted by the appropriate academic disciplines, and engage honestly in all academic assignments.

In cases of student misconduct, the student's College Executive Committee may defer or withhold his or her degree for a specified period of time. The Dean of Students may recommend such an action to the College Executive Committee.

## Policy

University Of California Policies Applying to Campus Activities, Organizations, and Students, section 100.00 Policy on Student Conduct and Discipline states that "Chancellors may impose discipline for the commission or attempted commission (including aiding or abetting in the commission or attempted commission) of the following types of violations by students:

- 102.1** All forms of academic misconduct including but not limited to cheating, fabrication, plagiarism, or facilitating academic dishonesty.
- 102.2** Other forms of dishonesty including but not limited to fabricating information, furnishing false information, or reporting a false emergency to the University."

## Procedures

### I. Requirements and Expectations

**Research** To foster intellectual honesty, schools, departments and research units at UCR are encouraged to develop statements that fit the distinctive research climate and needs of their individual disciplines. These guidelines may cover responsibilities of research supervisors, assignment of credit for publications, training of research apprentices, requirements for record keeping of experimental procedures and data storage, and standards for merits and promotions which value quality over quantity.

It is the responsibility of each individual engaged in research at UCR to be informed of University policies relating to research and of the policies and procedures of the agencies funding his or her research. Copies of relevant policies are available in the Office of Research and will be provided at no cost.

**Courses** Faculty members, teaching assistants, and other instructional personnel are encouraged to include statements addressing academic integrity as part of the syllabus for every course and to educate students about expectations and standards in the context of the course in order that students may not, through ignorance, subject themselves to the charge of academic misconduct. Instructors are further encouraged to inform students of campus resources available for dealing with academic difficulty.

### II. Faculty Actions

**Research** In cases of alleged academic integrity violations in research, faculty members, teaching assistants, and other instructional personnel should report suspicion of fraudulent or unethical research practice by students immediately to the Chair of the department, Dean of the school or Director of the organized research unit. The report must then be forwarded to the Associate Dean for Research who will be responsible for coordinating further actions.

**Courses** If a faculty member, teaching assistant, or other instructional personnel suspects that an act of academic misconduct has occurred in a course, s/he must communicate with the student regarding the alleged act of misconduct and the information upon which the allegation is based within 30 business days of discovery of the alleged act. Under special circumstances, the instructor may make a request for an extension of time through the Vice Provost for Conflict Resolution. Whenever possible, the communication should take place through an in-person consultation and should be conducted in a manner that respects each student's privacy and maintains an environment that supports teaching and learning. When a meeting is not possible or practical, an instructor may communicate with

the student in writing. Written communication will be sent by U.S. mail to the address most recently filed with the Registrar's Office, or to the student's University e-mail address. When multiple students are involved, faculty are encouraged to communicate with each student separately.

An instructor may request the assistance of the Ombudsperson or a member of the Student Conduct & Academic Integrity Programs staff to be present at the conference to assist in a fair and focused discussion about what may have occurred.

The student must be given the opportunity to respond to the allegation of misconduct. When communication is made in writing, students will be given 10 business days to respond.

After conferring with the student and/or considering the student's written response, the instructor will, determine whether it is more likely than not that the student committed an act of academic misconduct. In making this determination the instructor will pay attention not to whether the student meant to engage in misconduct, but whether the misconduct occurred. The instructor may then follow up with one of the following actions:

- A. In cases where the instructor determines that there is no misconduct, s/he may dismiss the allegation and take no further action.
- B. In cases where the student does not dispute the facts upon which the charges are based, the instructor may impose an appropriate academic sanction, taking into account the clarity of course expectations, the level of the students' experience or knowledge of principles of academic integrity, the nature of the assignment, and the degree of intentionality and pre-meditation of the misconduct.

Actions taken must be documented through the Academic Misconduct Referral form, or a referral memo to Student Conduct & Academic Integrity Programs, the central location where all records of incidents of academic dishonesty are kept on file. It is essential that the form or referral memo include the student's name and student identification number, the name of the class in which the act took place, the date or time period in which the act occurred, a description of the academic misconduct, a summary of actions taken, all original documentation supporting the charge, and the academic sanctions assigned.

- C. In cases where the student disputes the facts upon which the charges are based, the instructor will refer the case to Student Conduct & Academic Integrity Programs. The Academic Misconduct Referral form or memo must include the student's name and student identification number, the name of the class in which the act took place, the date or time period in which the act occurred, a description of the academic misconduct, a summary of actions you have taken, all original documentation supporting the charge (except where prohibited by law), and the academic sanctions recommended. Faculty are encouraged to forward a copy of the course syllabus and other written communication that addresses academic integrity standards and expectations for the course. Faculty are further encouraged to evaluate the assignment or examination on its merits and to make note of the grade to be assigned in the event that the student is not found responsible for violation of the University's policies or where insufficient evidence exists to hold the student responsible.

Instructors who are in part-time or temporary appointments or who will be on sabbatical or other leave or who will be leaving the University are required to provide a copy of all documentation to the Department Chair, who will serve as a proxy for the instructor if s/he is unavailable to participate fully in resolving the allegations of misconduct.

If grades are awarded while the case is in progress, the faculty member will assign a temporary grade placeholder of Grade Delay "GD" pending the outcome of the process.

- D. Violations that the instructor believes to be particularly egregious shall be referred directly to the College Academic Integrity Committee in the instructor's College for review.

**Course Drops and Withdrawals** A student officially notified of alleged academic misconduct may not withdraw from the course until the determination of responsibility is made and any sanctions are imposed.

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A sanction for a violation of academic integrity that affects the course grade will be applied. The student may not avoid the imposition of a sanction by withdrawing from a course. If the student is found not responsible for academic misconduct, the student will be permitted to withdraw from the course with a grade of "W".

### III. Administrative Actions

**Research** The Associate Dean for Research, in consultation with the original recipient of the report, will review the description of the academic misconduct and documentation supporting the charge and determine if unethical conduct may have occurred, and if so, may undertake a preliminary inquiry or formal investigation following the guidelines outlined in UCR Policy on Integrity in Research, posted on the Office of Research Affairs Website at [www.ora.ucr.edu/ORA/announce/integrit.htm](http://www.ora.ucr.edu/ORA/announce/integrit.htm). In the event that the preliminary inquiry or formal investigation finds probable cause to warrant disciplinary proceedings, charges of misconduct will be processed in accordance with existing procedures for adjudicating alleged academic misconduct in courses.

#### Courses

A. In cases where the student does not dispute the facts upon which the charges are based, Student Conduct & Academic Integrity Programs, upon receipt of the Academic Misconduct Referral form, will follow up with the student in writing to formally advise the student of the academic sanctions assigned by the instructor as well as appropriate disciplinary sanctions assigned by the University.

The decision shall be forwarded in writing to the student within 15 business days of the review; and communicated to the instructor, college and/or division in accordance with legitimate educational interest criteria as articulated by the Family Education Rights and Privacy Act.

Students with a record of previous academic misconduct will be referred to the Academic Integrity Committee in their College for a formal hearing, with a recommendation that suspension or dismissal be considered.

B. In cases where the student disputes the facts upon which the charges are based, upon receipt of an Academic Misconduct Referral Form from an instructor, Student Conduct & Academic Integrity Programs will notify the student of the University Policy that was allegedly violated; the factual basis for the charges; and the right to be assisted by an advisor of choice or an attorney (at his or her own expense) and ask the student to schedule an Administrative Review. Within 15 working days of the referral of the matter to the SJA, notification will be sent to the student by U.S. mail to the address most recently filed with the Registrar's Office, or to the student's University e-mail address.

Whenever possible an Administrative Review will be scheduled such that both the faculty member and the student can attend. The purpose of an Administrative Review is to explore and investigate the incident giving rise to the appearance of academic dishonesty, and to reach an informed conclusion as to whether or not academic dishonesty occurred. In keeping with the ultimate premise and justification of academic life, the duty of all persons at a Review is to assist in a thorough and honest exposition of all related facts. A Review is not in the character of a criminal or civil legal proceeding. It is not modeled on these adversarial systems; nor does it serve the same functions; rather, it is an academic process unique to the community of scholars that comprise a University. The review will:

- explain fully the alleged violation of the Standards of Conduct
- review written materials associated with the alleged misconduct
- give the student and the instructor the opportunity to present their accounts of the incident and present any witnesses or other individuals who may have relevant information about the incident
- address how the student's alleged conduct was judged, why the behavior is unacceptable, the impact of conduct on others in the community, causes and motives of the conduct, and alternatives for balancing personal circumstances with needs and expectations of the community

In the event that Student Conduct & Academic Integrity Programs determines it is more likely than not that the student is responsible for

academic misconduct, the academic sanctions recommended by the faculty member as well as appropriate disciplinary sanctions will be assigned taking into account the clarity of course expectations, the level of the student's experience or knowledge of principles of academic integrity, the nature of the assignment, and the degree of intentionality and premeditation of the misconduct.

The decision shall be forwarded in writing to the student within 15 business days of the review and communicated to the instructor, college and/or division in accordance with legitimate educational interest criteria as articulated by the Family Education Rights and Privacy Act. In cases where the instructor has held a grade in abeyance pending the outcome of an Administrative Review, s/he shall submit a final grade with the Registrar that is consistent with the decision of Student Conduct & Academic Integrity Programs as to the question of misconduct.

In the event that Student Conduct & Academic Integrity Programs receives an allegation of academic misconduct by a student who previously has been charged and found responsible for academic misconduct or encounters a case that is sufficiently complex to require additional consultation the case will be referred to the Academic Integrity Committee in the instructor's College, with the request that the case be resolved through a formal hearing.

### IV. Academic Integrity Committees

#### College Academic Integrity Committees

An Academic Integrity Committee will be established in each of the Colleges and for the Graduate Division/Professional Schools<sup>1</sup> to:

- hear cases referred by Student Conduct & Academic Integrity Programs that are sufficiently complex to require additional review
- hear serious and repeated violations of academic misconduct upon referral from an instructor or Student Conduct & Academic Integrity Programs
- hear appeals of decisions and/or sanctions imposed by an instructor or Student Conduct & Academic Integrity Programs

In the Spring quarter, the Committee on Committees shall appoint 4 BCOE faculty, 4 SoBA faculty, 2 GSOE faculty, 6 CHASS faculty and 6 CNAS faculty to the panels to serve one year terms effective July 1-June 30. Four to six full-time undergraduate students, and four to six graduate students will be appointed to each College Committee and shall serve one year terms effective July 1-June 30. In all cases an effort will be made to appoint members who represent the disciplinary diversity within each College. The undergraduates shall be chosen from the undergraduate student body by the Associated Students of UCR. The graduate students shall be chosen from the graduate student body by the Graduate Student Association. Students who have been suspended or are on academic or disciplinary probation, evicted from University Housing for reasons related to conduct, or who have a case pending before the Student Conduct Committee or an Academic Integrity Committee are not eligible to serve as committee members. (Am 20 February 07)

A hearing panel of 3-5 members will be drawn from the pool of appointees for each case. A quorum of the committee consists of three persons, with at least one faculty member, one student for College Committees and one faculty member and one graduate student for the Graduate/Professional School Committee. In the absence of a quorum, the hearing will be rescheduled. Staff support to the Committee will be provided by the Vice Provost for Conflict Resolution or his/her designee.

The purpose of an Academic Integrity Committee Hearing is to explore and investigate the incident giving rise to the appearance of academic dishonesty, and to reach an informed conclusion as to whether or not academic dishonesty occurred. In keeping with the ultimate premise and justification of academic life, the duty of all persons at a hearing is to assist in a thorough and honest exposition of all related facts. A hearing is

<sup>1</sup>The Academic Integrity Committee for the College of Humanities, Arts, and Social Sciences shall address violations associated with Business Administration faculty and undergraduate students as articulated in these procedures. The Academic Integrity Committee for graduate/professional schools shall address alleged violations by credential and graduate students in the colleges of Humanities, Arts, and Social Sciences; Natural and Agricultural Sciences; Engineering; and schools of Education and Management.

not in the character of a criminal or civil legal proceeding. It is not modeled on these adversarial systems; nor does it serve the same functions; rather, it is an academic process unique to the community of scholars that comprise a University.

The Vice Provost for Conflict Resolution or his/her designee will serve as a non-voting Chair to facilitate the hearing. The Chair shall rule on all questions of procedure and evidence, including but not limited to: the order of presentation of evidence, admissibility of evidence, applicability of regulations to a particular case, and relevance of testimony. An Academic Integrity Committee Hearing will normally proceed as follows:

- A. Committee members will receive and review a copy of the notification of charges and documentary evidence provided by the instructor, the University, and the student.
- B. The Chair will ask all present at the hearing to introduce themselves for the record. The Chair will invite committee members to disqualify themselves from participation in the hearing if they believe for any reason that they cannot render a just and fair decision and will invite the student to request that a member be disqualified as a result of prior involvement in the case or if the student believes for an appropriate reason that a committee member cannot render a just and fair decision.
- C. The charges shall be read aloud and the student shall be asked to respond to the charges by accepting responsibility, accepting responsibility and noting that there are mitigating circumstances, or denying responsibility for the alleged violations of University of California Policies Applying to Campus Activities, Organizations, and Students.
- D. The faculty member and the student will be given the opportunity to present their accounts of the incident and present any witnesses or other individuals who may have relevant information about the alleged academic misconduct.
- E. Committee members will be given an opportunity to ask questions of the faculty member, the student, and witnesses.
- F. Upon conclusion of this discussion, each party will be asked if there is any additional information needed or if any discrepancies or questions need to be presented or addressed.
- G. All parties will be required to leave the room while the Committee deliberates. After its discussion, the Committee will decide if a preponderance of the evidence indicates that the student is responsible or not responsible for alleged violations of University of California Policies Applying to Campus Activities, Organizations, and Students by way of a simple majority vote.
- H. If the student is found to be responsible for violations of Policies, the Committee shall be informed of the student's prior record to determine whether the student has been found responsible for previous academic misconduct. Based on this information, the Committee will determine the sanction(s) to be assigned, how and for how long the record of the sanction will be maintained on the student's permanent record, and the conditions that must be met for the record to be removed, if any. In the event that the Committee determines that dismissal is warranted for a graduate student, this determination must be framed as a recommendation and forwarded to the Dean of the Graduate Division for review and approval.
- I. Once the Committee has reached a decision on the sanction(s), the Chair will ask the parties involved to return to the room, and the results of the deliberation will be presented. Within fifteen business days, the Vice Provost for Conflict Resolution or his/her designee will mail notification to the student and instructor, and college or division detailing the decision and the sanctions imposed by the Committee and outlining the appeal process.

A tape recording of the hearing, but not the deliberations, shall be made and retained in Student Conduct & Academic Integrity Programs as part of the record for as long as the disciplinary record is retained, or for five years from the date of decision, whichever is shorter. The student may obtain a copy of the recording upon paying the expense of making such copy. Either party may arrange for a

stenographer to make a full transcript of the proceedings at his/her own expense. If one party has the proceedings transcribed, arrangements shall be made before the hearing as to how to apportion the cost if both parties want copies. Other than for the purpose of the official record as provided above, mechanical or electronic devices for recording or broadcasting shall be excluded from the hearing.

1. The Academic Integrity Committee for the College of Humanities, Arts and Social Sciences shall address violations associated with Business Administration faculty and undergraduate students as articulated in these procedures. The Academic Integrity committee for Graduate/Professional Schools shall address alleged violations by credential and graduate students in Humanities, Arts and Social Sciences, Natural and Agricultural Sciences, Engineering, the School of Education, and the School of Management.

#### **Campus Academic Integrity Executive Committee**

One faculty member and one student from the Academic Integrity Committee in each College will make up a Campus Academic Integrity Executive Committee. The Executive Committee will:

- review, on an annual basis, cases addressed through instructors and Student Conduct & Academic Integrity Programs; to provide oversight and direction and to ensure that policies and procedures are appropriate and properly applied
- hear appeals of primary/non-appellate decisions and sanctions of a College Academic Integrity Committee

#### **V. Appeals**

Decisions of an instructor or Student Conduct & Academic Integrity Programs may be appealed through the College Academic Integrity Committee in the faculty member's College. Appellate decisions of a College Academic Integrity Committee are final.

Primary decisions of a College Academic Integrity Committee may be appealed to the Campus Academic Integrity Executive Committee. Appellate decisions of the Campus Academic Integrity Executive Committee are final.

Appeals must be based on one or more of the following:

- new evidence not reasonably available at the time of the original hearing, the absence of which can be shown to have had a detrimental impact on the outcome of the hearing
- procedural error that can be shown to have had a detrimental impact on the outcome of the hearing
- errors in the interpretation of University policy so substantial as to deny one of the parties a fair hearing
- grossly inappropriate sanction having no reasonable relationship to the charges

Either party may appeal a decision in writing to the appropriate Committee, through the University Administrator, within ten (10) business days after the written decision is made available. All appeals must be authored and signed by the submitting party. Appeals produced by advisors or other non-parties will not be considered.

The filing of a timely appeal suspends the imposition of sanctions until the appeal is decided, but interim action may be taken as determined by the Chair of the hearing. Grades or degrees may be withheld pending conclusion of the appeal.

When an appeal has been filed, the appropriate parties may be requested to respond in writing to the matters in question before a decision about the appeal is made. The Committee will determine whether the grounds for appeal have been satisfied and whether further process is necessary to resolve the appeal. Findings of fact will be accepted as determined by the original adjudicator or adjudicating body, unless the appellate body determines that the original adjudicator or adjudicating body acted in an arbitrary, capricious, or unfair manner.

The Committee will make a decision based on the written submissions within fifteen (15) business days, or indicate in writing what further process is necessary for final resolution.

The Committee may approve, reject, or modify the decision and sanction in question. The action taken shall be communicated in writing to the student, the faculty member, and Student Conduct & Academic Integrity Programs, within fifteen (15) working days after receipt of the appeal and related documents. The decision of the appeal committee is final.

## VI. Maintenance Of Records

Student Conduct & Academic Integrity Programs shall serve as the central location where all written, tape recorded, and electronic records of incidents of academic misconduct are kept on file. The records will be readily available for review by the Deans and Associate Deans of each College, the Dean of the Graduate Division, the Executive Vice Chancellor and Provost and the Vice Provost for Conflict Resolution in accordance with legitimate educational interest criteria as articulated by the Family Educational Rights and Privacy Act.

The file of a student found in violation of campus regulations (including the transcripts or recordings of the hearing) will be maintained by the Student Conduct & Academic Integrity Programs for a period of at least five years from the date of the letter providing notice of final disciplinary action, unless otherwise determined by the Assistant Provost for Conflict Resolution. When, as a result of a violation of the Standards of Conduct, a student is suspended, the fact that suspension was imposed must be posted on the academic transcript for the duration of the suspension. When a student is dismissed, the fact that dismissal was imposed must be posted on the academic transcript permanently.

## Academic Misconduct

Chancellors may impose discipline for the commission or attempted commission of academic misconduct including, but not limited to, cheating, fabrication, plagiarism, or facilitating academic dishonesty.

Examples of sanctions that may be imposed include assignment of a lower grade, assignment of a failing grade, required participation in educational activities, disciplinary probation, or being dismissed from the university. The level of sanction depends on the violation committed. Procedures for review of misconduct and imposition of sanctions can be obtained from Student Conduct and Academic Integrity Programs at [conduct.ucr.edu](http://conduct.ucr.edu).

A student officially notified of alleged academic misconduct may not withdraw from the course where misconduct is believed to have occurred, until the determination of responsibility is made and any sanctions are imposed. A sanction for a violation of academic integrity that affects the course grade will be imposed. The student may not avoid the imposition of a sanction by withdrawing from a course. If the student is found not responsible for academic misconduct, the student will be permitted to withdraw from the course with a grade of "W."

## Academic Misconduct Defined

Academic misconduct is any act that does or could improperly distort student grades or other student academic records. The following examples of academic misconduct are provided to assist students in developing an understanding of the university's expectations, recognizing that no set of written guidelines can anticipate all types and degrees of violations of academic integrity. To the extent that the examples provided are not exhaustive, duly appointed representatives of the university will judge each case according to its merits.

Misunderstanding of the appropriate academic conduct will not be accepted as an excuse for academic misconduct. If students are in doubt about appropriate academic conduct in a particular situation, they should consult with the instructor in the course to avoid the serious charge of academic misconduct.

### Cheating

- copying from another student's examination, quiz, laboratory work, or homework assignment
- possession or use of pre-prepared notes or other resources, in any form, during an examination, unless such use is expressly authorized by the instructor
- revising a work after its final evaluation and representing the revised version as being the original work

- using external assistance, including but not limited to tutors, books, notes, and calculators, on any in-class or take-home examination, unless the instructor specifically has authorized external assistance
- allowing someone else to conduct one's research or to prepare one's work without advance authorization from the instructor to whom the work is being submitted
- unauthorized use of electronic instruments, such as cell phones, pagers, or PDAs, to access or share information
- submitting for academic advancement an item of academic work that the same student has previously submitted for academic advancement, without prior authorization from the faculty member supervising the work

### Plagiarism

- using another's work without giving credit
- copying the language, structure, or ideas of another and attributing (explicitly or implicitly) the work to one's own efforts
- reproducing another person's work, with or without that person's knowledge or permission, whether published or unpublished, including but not limited to original ideas, strategies, and research, art, graphics, computer programs, music, and other creative expression. The work may consist of writing, charts, pictures, graphs, diagrams, data, Web sites, or other communication or recording media, and may include sentences, phrases, and innovative terminology, formatting, or other representations.
- submitting as one's own any academic exercise prepared totally or in part by another
- copying information from computer-based sources, i.e., the Internet
- allowing another person to substantially alter or revise one's work and submitting it as one's own
- using another's written ideas or words without properly acknowledging the source. The term "source" includes published works (books, magazines, newspapers, Web sites, plays, movies, photos, paintings, and textbooks) and unpublished sources (class lectures or notes, handouts, speeches, casual conversation, other students' papers, or material from a research service).
- failure to acknowledge study aids such as Cliffs Notes or common reference sources
- unauthorized use of another person's data in completing a computer exercise or other class work

### Unauthorized Collaboration

- working with other students to do lab work, review books, or develop a presentation or report without permission from the instructor to do so
- making lab data available to a student who did not attend the lab
- jointly calculating homework problems without professorial permission
- having someone else help rewrite a paper
- sharing sources for a take-home exam
- working in a group on a lab assignment without professorial permission
- debugging another's computer program without professorial permission
- submitting a group assignment, or allowing that assignment to be submitted, representing that the project is the work of all of the members of the group when not all of the group members assisted substantially in its preparation

### Facilitating Academic Dishonesty

- intentionally or knowingly helping or attempting to help another student to commit an act of academic misconduct
- giving unauthorized assistance to another or others during a test or evaluation, including allowing someone to copy from a test or examination, or arranging with others to give or receive answers via signals
- providing specific information about a recently given test, examination, or assignment to a student who thereby gains an unfair advantage in an academic evaluation
- substituting for another student in order to meet a course or graduation requirement
- providing aid to another person, knowing such aid is expressly prohibited by the instructor, in the research, preparation, creation, writing, performing, or publication of work to be submitted for academic evaluation
- permitting one's academic work to be represented as the work of another
- signing in other students for class attendance

**Interference or Sabotage**

- destroying, stealing, changing, or damaging another's lab experiment, computer program, term paper, exam, or project
- removing, defacing, damaging, hoarding or displacing library materials with the effect that others have undue difficulty using them
- interfering with the operation of a computer system so it has an adverse effect on the academic performance of others
- damaging computer equipment (including disks) or laboratory equipment in order to alter or prevent the evaluation of academic work

**Fabrication**

- falsifying the results of any laboratory or experimental work or fabricating any data or information
- crediting source material that was not used for research
- falsifying, altering, or misstating the contents of documents or other materials related to academic matters, including but not limited to schedules, prerequisites, transcripts, attendance records, or university forms
- giving false reasons (in advance or after the fact) for failure to complete academic work, including but not limited to giving false excuses to a faculty member or to any university official for failure to attend an exam or to complete academic work
- giving false information or testimony in connection with any investigation or hearing under this policy

**Failure to Comply with Research Regulations**

- failure to comply with research regulations such as those applying to human subjects, laboratory animals, and standards of safety

**Retaliation**

- retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith

## Campus Policies and Regulations

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### Disabled Access Grievance Procedure

UCR remains committed to its historical excellence in the area of accessibility for the disabled. UCR, in compliance with federal laws, state laws, and university regulations, does not discriminate on the basis of race, color, national origin, sex, disability, or age in any its programs, activities, services, or practices.

This nondiscrimination policy covers admission and access to, and treatment and employment in, university programs and activities. As well, individuals may complain of any action which they believe discriminates on the grounds of race, color, national origin, sex, disability, or age.

The Vice Chancellor, Finance and Business Operations, is designated as the employee responsible for coordinating the university's efforts to comply with Section 504 of the Rehabilitation Act of 1973 and with the Americans with Disabilities Act of 1990. The following procedure has been established. Problems and complaints should be brought to the following offices or to the Vice Chancellor, Finance and Business Operations, who will refer them to the appropriate office for resolution.

**Vice Chancellor, Finance and Business Operations**, 4118A Hinderaker Hall: staff employment issues, facility accessibility, renovation of current facilities and planning of new ones, general campus transportation

**Executive Vice Chancellor and Provost**, 4148 Hinderaker Hall: faculty employment issues, accessibility of computers, faculty accommodation of students

**Student Special Services**, 125 Costo Hall: student support (adaptive equipment, note takers, interpreters, on-campus transportation, learning disability, classroom inaccessibility). Concerns that are not resolved by this office should be brought to the Vice Chancellor, Student Affairs, 2108 Hinderaker Hall.

A written, signed request for accommodation, together with documentation such as a physician's certification, is necessary when making a request.

## Campus Policies and Regulations Applying to Students

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### E-mail and Computer Expectation Policy

The primary mode of campus communication is e-mail, and it is therefore mandatory for students to utilize their UCR Webmail accounts to review academic and administrative electronic correspondence. UCR strongly recommends that all students have a computer with Internet access. UCR faculty will assume students have such access, and academic work may require it. The UCR administration will also assume that students have Internet access, and many administrative tasks may require students to use the Internet. For information concerning computer acquisition, student network access, student computing laboratories, and student computer support, visit UCR's Student Computing Services Web, [iguide.ucr.edu](http://iguide.ucr.edu).

### Student Conduct and Responsibility

Students enrolling in the university assume an obligation to conduct themselves in a manner compatible with the university's function as an educational institution. Students shall refrain from conduct which interferes with university teaching, research, administration, or the university's subsidiary responsibilities, or which endangers the health or safety of members of the university community or of visitors to the campus, and from disorderly conduct on university premises or at university-related events.

In cases of student misconduct, the student's College Executive Committee may defer or withhold his or her degree for a specified period of time. The Dean of Students may recommend such an action to the College Executive Committee.

By authority of the Board of Regents, the Chancellor is entrusted with full power to act in the administration of student discipline. Rules concerning student conduct, student organizations, use of university facilities and related matters are set forth in both university policies and campus regulations, copies of which are available upon request at the Vice Chancellor, Student Affairs office, Student Conduct and Academic Integrity Programs, or at [conduct.ucr.edu](http://conduct.ucr.edu). Particular attention is called to the *University of California Policies Applying to Campus Activities, Organizations, and Students* and to the campus regulations implementing them. The UCR Student Discipline Procedures are also available in the Vice Chancellor, Student Affairs office.

### Anti-Hazing

Hazing is strictly prohibited by both California law and University of California policy. California Penal Code, Section 245.6 (b) defines "hazing" as any method of initiation or preinitiation into a student organization or student body, whether or not the organization or body is officially recognized by an educational institution, which is likely to cause serious bodily injury to any former, current, or prospective student of any school, community college, college, university, or educational institution of this state. The term "hazing" does not include customary athletic events or school-sanctioned events. University of California policy further defines "hazing" as participation in hazing or any method of initiation or preinitiation that causes, or is likely to cause, physical injury or personal degradation or disgrace resulting in psychological harm to any student or other person. Incidents of hazing may be addressed through student disciplinary action, criminal charges, and/or civil action.

More information about hazing and how to report hazing is available in the Vice Chancellor, Student Affairs office or Student Conduct and Academic Integrity Programs office.

### Fees

Students are expected to pay all fees and charges which they incur. Those with outstanding obligations to the university are not allowed to register; obtain a diploma, transcript of official record, or verification of student status; or participate in certain university services.

## Nondiscrimination

The University of California, in compliance with Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Age Discrimination in Employment Act of 1967, the Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, and the Civil Rights Act of 1991, does not discriminate on the basis of race, color, national origin, religion, sex, physical or mental disability, or age in any of its policies, procedures, or practices; nor does the university, in compliance with Section 402 of the Vietnam Era Veterans Readjustment Assistance Act of 1974, and Section 12940 of the State of California Government Code, discriminate against any employees or applicants for employment because they are special disabled veterans or veterans of the Vietnam era, or because of their medical condition (as defined in Section 12926 of the California Government Code), their ancestry, or their marital status; nor does the university discriminate on the basis of citizenship, within the limits imposed by law or university policy; nor does the university discriminate on the basis of sexual orientation. The university's general nondiscrimination policy covers admission, access, and treatment in university programs and activities, and application for and treatment in university employment.

In conformance with university policy and pursuant to Executive Orders 11246 and 11375, Section 503 of the Rehabilitation Act of 1973, and Section 402 of the Vietnam Era Veterans Readjustment Assistance Act of 1974, the University of California is an affirmative action/equal opportunity employer.

## Rape and Other Forms of Sexual Assault

The Protocol for Handling Incidents of Acquaintance Rape, Stranger Rape, and Other Sexual Assaults Involving Students is available at the Vice Chancellor, Student Affairs office.

## Sexual Harassment

The University of California is committed to creating and maintaining a community in which all persons who participate in university programs and activities can work together in an atmosphere free of all forms of harassment, exploitation, or intimidation, including sexual. Specifically, every member of the university community should be aware that the university is strongly opposed to sexual harassment and that such behavior is prohibited by law and by university policy. The university intends to take whatever action may be needed to prevent, correct, and, if necessary, discipline behavior that violates this policy.

**Definition** Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassments when

1. Submission to such conduct is made either explicitly or implicitly a term or condition of instruction, employment, or participation in other university activities
2. Submission to or rejection of such conduct by an individual is used as a basis for evaluation in making academic or personnel decisions affecting an individual
3. Such conduct has the purpose or effect of unreasonably interfering with an individual's performance or creating an intimidating, hostile, or offensive university environment

In determining whether the alleged conduct constitutes sexual harassment, consideration shall be given to the record of the incident as a whole and to the totality of the circumstances, including the context in which the alleged incidents occurred.

**Information Centers** Confidential information and advising are available from the following:

1. Women's Resource Center, 260 Costo Hall, (951) 827-3337
2. Counseling Center, Veitch Student Center, (951) 827-5531
3. Office of the Ombudsperson, University Cottage, (951) 827-3213
4. Faculty and Staff Affirmative Action Office, University Cottage, (951) 827-5604

**Director of Faculty and Staff Affirmative Action** The complaint resolution officers for UCR are the Director of Faculty and Staff Affirmative Action and the Ombudsperson. Both offices are in University Cottage. The Title IX Coordinator is Debbie Artis, 350 Surge, (951) 827-7070.

The UCR Sexual Harassment Policy applies to all students, faculty, and staff. Copies are available from the Director of Faculty and Staff Affirmative Action and the campus Ombudsperson.

## Speech and Assembly

Campus policies and procedures governing use of "free speech" on campus and conduct at "speakers and other public events" are available in the Vice Chancellor, Student Affairs office.

## Student Grievances

The Non-academic Student Grievance Procedures are available in the Vice Chancellor, Student Affairs office.

## Substance Abuse

UCR is committed to achieving and maintaining a campus community that fosters personal and institutional excellence and strives to provide conditions under which the work of the university can go forward freely, with the highest standards of quality and institutional integrity. In keeping with this commitment, each student should help to create a campus community that is free from the problems of substance abuse and dependency.

The Official Notice to Students Regarding Substance Abuse in University Campus Communities is issued pursuant to the requirements of Subpart B, Section 86.100 of the federal Drug-Free Schools and Communities Act of 1989. Students found to be in violation may be disciplined. Discipline can vary in severity from warning to expulsion from the University of California.

The text of the Official Notice along with Legal Sanctions Pertaining to the Use of Alcohol and Controlled Substances (a list of applicable federal and state laws) can be obtained from the Vice Chancellor, Student Affairs office.



# Undergraduate Studies

## Goals of an Undergraduate Education

The faculty of UCR hereby declare the following set of general educational goals to be pursued through our individual and collective efforts in teaching and guiding the undergraduates of this campus.

A university education must help students realize their potential as individuals and contributing participants in society. This involves the acquisition of knowledge and skills, as well as preparation for future responsibilities.

A general education provides a framework that enables one to appreciate and critically examine the significant aspects of civilization. This framework is derived from the study of world history; political and economic systems; the ethnic, cultural, and religious diversity of the peoples of the Earth; the arts and letters of all cultures; the social and natural sciences; and technology. Such a broad education is the foundation for concentrated studies that enable students to prepare for careers and to strive for an understanding of the world in which they live and about which they must make decisions.

A university education nurtures the critical skills of oral and written communication, including the exercise of these skills in a language other than one's own. It must teach students to become verbally and quantitatively literate, to analyze and synthesize, and to regard the acquisition of knowledge as a lifetime activity. A university education must promote tolerance of the opinions of others and an understanding of the mutual dependence of human beings on each other and on their natural environment. The student's university years also provide an opportunity to develop integrity, self-esteem, self-discipline, style, humanness, commitment to the general welfare, sensitivity to the interplay of environment and technology, and confidence that the human drama is worthy of a lengthy future.

UCR has three undergraduate colleges and one undergraduate school that offer bachelor's degrees: Humanities, Arts, and Social Sciences; Natural and Agricultural Sciences; Engineering, and Business Administration.

## Requirements for the Bachelor's Degree

Requirements for the bachelor's degree vary according to the college and major selected. There are three kinds of requirements: general university, college, and major.

1. General University requirements
  - Entry-Level Writing
  - American History and Institutions Unit
  - Scholarship
  - Residence
2. College breadth requirements
  - English Composition
  - Humanities
  - Social Sciences
  - Ethnicity
  - Foreign Language
  - Natural Sciences and Mathematics
  - Additional Courses
3. Major requirements
  - Lower-Division or Core Courses
  - Upper-Division Courses

Students should plan a program of study carefully and consult an academic advisor. Students are responsible for meeting all requirements for graduation.

## General University Requirements

General university requirements are university-wide requirements that all undergraduates must satisfy. The following regulations and requirements are applicable to all undergraduate students on the Riverside campus.

## University of California Entry-Level Writing Requirement

All university faculty assume that students are proficient in reading and writing English, and that they understand how to compose an essay on an academic topic. For this reason, students are asked to provide proof of their writing ability on entering the university.

Completion of the UC Entry Level Writing Requirement is a prerequisite to ENGL 001A. The UC Entry Level Writing Requirement may be completed after enrollment in the university by passing an Entry Level Writing Requirement course as directed by the University Writing Program (see below). It may be completed before enrollment in any one of the following ways:

1. Receiving a score of 680 or above on the SAT II: Writing Subject Test of the College Board.
2. Achieving a score of 30 on the ACT Combined English/Writing test or a score of 680 or higher on the SAT Reasoning test (Writing section).
3. Receiving a score of 3, 4, or 5 on the College Board Advanced Placement Test in English (Language and Composition or English Literature and Composition). In addition to fulfilling the UC Entry-Level Writing Requirement, a score of 3 satisfies the ENGL 001A requirement; a score of 4 or 5 satisfies the ENGL 001A and ENGL 001B requirements.
4. Receiving a score of 5, 6, or 7 on the International Baccalaureate Higher Level Examination in English (Language A only).
5. Completion with a grade of "C" or better of a 4 quarter unit or 3 semester unit college-level course in English composition, taken at another institution before the student enters the university and judged acceptable by the Office of Undergraduate Admissions.
6. Receiving a passing grade on the UC Analytical Writing Placement Exam administered by the UC System.

All freshmen from California high schools who have not met the UC Entry Level Writing Requirement and who are entering in the fall quarter must take the UC Analytical Writing Placement Exam to be administered throughout the state. The examination is normally given the second Saturday in May.

Early in April, students who have not passed the Entry Level Writing Requirement will receive an email or letter directing them to the test center at which they must take the AWPE.

Out-of-state students and students admitted after the test notification date will take the examination on campus. For more information, see [www.ucop.edu/elwr](http://www.ucop.edu/elwr).

Students also have an opportunity to pass the requirement in UCR's summer sessions by passing ENGL 004 or ENGL 005 before they become full-time students in the fall. They can also take a pre-ENGL 001A class during the summer at a local college or university before they become full-time students at UCR. Students taking summer courses not at UCR can then retake the UC Analytical Writing Placement Exam at UCR at the end of the summer.

Students who have not met the requirement upon entrance to UCR are placed into one of the following UCR courses of instruction. Placement in these courses is determined by the Director of the University Writing Program and is based on the student's performance on the UC Analytical Writing Placement Exam.

1. BSWT 003 (an ESL course preparatory to ENGL 004)
2. ENGL 004
3. ENGL 005
4. A qualifier course plus ENGL 006D

To pass the Entry-Level Writing Requirement (once enrolled as full-time students), students must earn a course grade of "C" (2.0) or better in ENGL 004, ENGL 005, ENGL 01PA, or earn a course grade of "C" (2.0) or better in a qualifier course approved by the University Writing Program and the Academic Senate.

According to systemwide regulations, any student who has not satisfied the

Entry-Level Writing Requirement after three quarters of university residence (three quarters of enrollment during the regular academic year) is not normally eligible to enroll for a fourth quarter at the University of California. (For students placed in BSWT 003, this three-quarter residence rule begins after satisfactory completion of BSWT 003 or at the start of their fourth quarter of regular enrollment at UCR, whichever comes first.) Students are encouraged to complete the requirement as soon as possible in their freshman year.

## American History and Institutions

Candidates for a bachelor's degree must satisfy the requirement in American History and Institutions by demonstrating a knowledge of American history and of American political institutions and ideals. The requirement may be satisfied by satisfactory completion of any one of the following:

1. One (1) high school unit in American History, or 1/2 high school unit in American History and 1/2 high school unit in civics or American Government
2. The requirement in a junior college or other accredited institution
3. One college course in the field of American History or one college course in the field of American Government. UCR courses that fulfill this requirement are HIST 017A or 017B, POSC 010, POSC 100, and POSC 113

Students applying for one of the teacher credential programs should check with the Graduate School of Education concerning limitations on ways of meeting this requirement.

Further information regarding the requirement and how to meet it by examination may be obtained from the chair of the Committee on Preparatory Education.

## Unit Requirement

A minimum of 180 units of academic work with a grade point average of 2.00 in all courses undertaken in the UC is required for graduation.

Not more than 6 units of physical education activities courses, no 400 series course, and not more than three courses in the 300 series may be counted toward the 180 unit requirement.

## Scholarship Requirement

To receive a bachelor's degree, students must obtain twice as many grade points as units (2.00 grade point) for all courses attempted in the university. An exception to this rule is made for those students undertaking certain honors courses.

## Residence Requirement

The minimum residence at the UC required for a degree is three quarters. One of the three quarters may be completed in a UCR summer session in which the student carries 12 units, unless a reduced load is approved in advance by the dean of the student's college.

Courses completed in UC Extension are not considered work in residence, even if taken through concurrent enrollment.

Thirty-five (35) of the final 45 units must be earned in residence in the student's college (this does not preclude the student from taking courses in other colleges on campus). For students who are enrolled in the Education Abroad Program, UC Washington, D.C. program, or UC Sacramento Program, 35 of the final 90 units, including the final 12 units, must be earned in residence. Eighteen (18) of the 35 units may be completed in summer session courses on the Riverside campus.

With the approval of the dean of a student's college or school, a candidate for the bachelor's degree who was in active service in the armed forces of the United States in the year preceding the awarding of the degree may be recommended for the degree after only one quarter of university residence in which the candidate completes at least 16 units or passes a comprehensive examination in the major or field of concentration.

# College Breadth Requirements

Each college has established additional requirements for a degree. The requirements of the colleges at Riverside are designed to stimulate an interest in areas of knowledge not necessarily related to a student's major field. Students should note that they consist of a certain number of units and courses covering a variety of fields. Although these requirements determine a large and important part of the four-year curriculum, there are opportunities for students in all departments to do special, independent work.

The main objective of the colleges on the Riverside campus is to provide a setting within which students may develop those qualities of mind and character necessary to intellectual advancement and to useful membership in society. The major areas of human knowledge form the substance of the colleges on the Riverside campus: the College of Humanities, Arts, and Social Sciences; the College of Natural and Agricultural Sciences; The Marlan and Rosemary Bourns College of Engineering; and The School of Business Administration. The breadth requirements for the colleges are similar; however, refer to each college's section for a detailed discussion of its requirements.

An alternative system of General Education Concentrations is available to most UCR undergraduates. Should a student choose to follow a concentration, he or she will follow a series of courses, at both the lower and upper division, chosen by faculty to represent an interdisciplinary approach to a specific topic. The concentrations are structured to give students, in addition to basic reasoning, writing, and computation skills, working knowledge of a field, analogous to an academic minor, which will complement their work in their major field. Pilot concentrations include "California" and "Climate Change/Sustainability." Details about these concentrations can be found under the College Breadth Requirements for the College of Humanities, Arts, and Social Sciences and The School of Business Administration.

Courses taken in a student's major discipline (including courses cross-listed with the major discipline) may not be applied toward satisfaction of the Humanities, Social Sciences, Ethnicity, or the Natural Sciences and Mathematics requirements except for Biology majors in connection with the Biological Sciences requirement, English majors in connection with the English Composition requirement, History majors in connection with the World History requirement, Ethnic Studies majors in connection with the Ethnicity requirement, Foreign Language majors in connection with language requirements, and students permitted by their college to take a Senate-approved alternative to English 1C in order to satisfy the third-quarter writing requirement. However, courses outside the major discipline, but required for the major, may be applied toward satisfaction of these requirements. Students are urged to make sure that they understand which courses are permitted to satisfy more than one requirement. Information on specific degree requirements and courses is available in the academic advising office in each college.

Placement exams may be required before a student takes courses in certain subjects, such as mathematics and foreign languages. The placement exam may be taken only once in each subject during a student's UCR career. For foreign languages, a sufficiently high score on the UCR placement exam can fulfill the Foreign Language requirement.

For details about the UC policy on intercampus reciprocity of breadth requirements and the UC policy on the Intersegmental General Education Transfer Curriculum, see below.

## Intercampus Reciprocity Policy Regarding Breadth/General Education Requirements

Students who transfer from one UC campus to another and who have completed the Breadth/General Education (B/GE) requirements of the campus from which they have transferred (except for upper-division B/GE requirements) will be considered to have met the B/GE requirements of the campus to which they transfer.

Courses taken for B/GE requirements at the campus from which they transfer will be accepted toward the appropriate B/GE requirements of the campus to which they transfer.

## Intersegmental General Education Transfer Curriculum (IGETC) Policy

The Intersegmental General Education Transfer Curriculum (IGETC) is a series of courses offered in the California community colleges that transfer students may complete as a way to satisfy the lower-division breadth/general education requirements at the UC or the California State University. The IGETC program is administered through the California community college system. Completion of the IGETC must be certified by a community college counselor and submitted to UCR with the student's final transcript before the first term of enrollment.

The IGETC is accepted for students pursuing majors in the College of Humanities, Arts, and Social Sciences and The School of Business Administration, as extensive major preparation is not required at the lower-division level. All students should ensure that the CHASS Student Academic Affairs office or the Undergraduate Business Programs Office have received the certified IGETC during their first quarter of UCR attendance.

The College of Natural and Agricultural Sciences does not accept IGETC, although courses taken to satisfy IGETC may be applied toward the college's breadth pattern. Although the Bourns College of Engineering (BCOE) accepts completion of IGETC as satisfying the majority of the college's breadth requirements for transfer students, some additional breadth coursework may be required after enrollment at Bourns. For more information on BCOE breadth requirements, go to [student.engr.ucr.edu/policies/requirements/breadth.html](http://student.engr.ucr.edu/policies/requirements/breadth.html). Prospective applicants are strongly encouraged to focus on preparatory course work for their desired major, such as mathematics, science, and other technical preparatory course work, rather than on IGETC completion. (Strong technical preparation is essential for success in the admissions process, and subsequently, in all coursework at Bourns.) For more information, go to [www.engr.ucr.edu/undergrads/transferring](http://www.engr.ucr.edu/undergrads/transferring).

## Major Requirements

A major is a coordinated group of upper-division courses giving depth to a student's work in a chosen area. A list of degrees offered and possibilities for establishing individual majors are described in each college section below. Degrees are also listed in the front of the catalog. A student should choose a major not later than the beginning of the junior year. However, a choice of major before that time facilitates program planning in most academic fields.

The departmental major represents advanced and relatively specialized work in one of the academic disciplines in the college. The interdepartmental or nondepartmental major is broader in scope and usually based upon two or more disciplines. The individual major is designed for the student who has an unusual but definite academic interest for which no suitable major is offered.

Major requirements are described in detail in the Programs and Courses section of this catalog under the department or program offering the major.

The responsibility for fulfillment of all degree requirements — general university, college, and major — rests with the student. Students are urged, however, to seek program counseling with appropriate advisors.

Assignment to a major or to the undeclared category (open to freshman and sophomore students) is based on the student's choice indicated on the Application for Admission. The student should enroll in accordance with this choice; changes may be made following course enrollment.

## Change of Major

Students may transfer from one major to another, elect a double major within their college, or add a second major in another college by filing a declaration with the dean of the colleges concerned.



# Graduate Studies

Graduate students at UCR are an essential part of the university's distinguished research teams and full partners in the undergraduate teaching mission of the faculty. Founded as a research institution in 1907, Riverside is the oldest of the UC's southern campuses. UCR combines the intellectual and material resources of the UC system with a uniquely intimate research environment, fostering a type of frequent and high-powered faculty-student contact unavailable at other universities.

Graduate degrees at UCR are research degrees, certifying that students are trained in the techniques of independent inquiry and have demonstrated the capacity to make unique contributions to their fields. Occupying a distinctive niche in disciplines ranging from chemistry to dance history, nematology to economics, UCR offers graduate programs leading to the degrees of doctor of philosophy, master of arts, master of education, master of fine arts, master of science, and master of business administration.

## Administration

Campus policies concerning graduate education are set by the Graduate Council, a committee of the Academic Senate, and carried out by the Graduate Division staff under the direction of the Graduate Dean.

In addition, each program has a graduate advisor appointed by the Graduate Dean. Advisors assist students in program planning and completing degree requirements and write a yearly evaluation of each student's progress toward the degree. Students should make an effort to confer regularly with their graduate advisor.

## Graduate Student Association

All graduate students are members of the Graduate Student Association (GSA), which seeks to represent their views and promote their interests with the faculty and administration, both at the campus level and universitywide. For a more detailed description of GSA activities and services, call (951) 827-3740. Further information can also be found under Graduate Student Association in the Services for Students section of this catalog, or e-mail [gsaucr@ucr.edu](mailto:gsaucr@ucr.edu).

## Application and Admission

The admission process has as its prime objective the selection of those students most likely to complete their chosen graduate programs with distinction. After consultation between the program and the Graduate Division, the final authority to admit rests with the Graduate Dean.

Applicants are initially reviewed and rated based on their undergraduate and, where appropriate, postbaccalaureate GPAs. The minimum requirement for admission to graduate status is the bachelor's degree or its academic equivalent from an accredited institution. However, the evaluation process is intended to be flexible, and programs take a variety of other factors into consideration when making their admissions recommendations, including GRE or other test scores, GPA in the major subject, letters of recommendation, and the reputation of the degree-granting program or institution.

Soon after the program forwards its recommendation to the Graduate Division, the applicant is notified in writing of the dean's decision. If admission is offered with work still in progress, official transcripts reflecting the satisfactory completion of this work and the awarding of the degree (where appropriate) must be submitted as soon as possible. An offer of admission is valid for a specific quarter only. Accepted students who wish to be admitted for a subsequent quarter must reapply and, if additional course work has been completed, submit updated transcripts.

Applicants should apply at [www.graduate.ucr.edu](http://www.graduate.ucr.edu).

Campus-wide application deadlines for domestic students are September 1 for the fall quarter, December 1 for the winter quarter, and March 1 for the spring quarter. The deadline for students seeking fellowship awards, teaching or research assistantships, and other merit-based forms of

## Graduate Degrees and Programs

Discipline	M.A.	M.S.	M.F.A.	Ph.D.
Anthropology	•	•		•
Art History	•			
Biochemistry and Molecular Biology		•		•
Bioengineering		• <sup>2</sup>		•
Biomedical Sciences		• <sup>1</sup>		•
Cell, Molecular, and Developmental Biology		•		•
Chemical and Environmental Engineering		• <sup>2</sup>		•
Chemistry		•		•
Classics		• <sup>1</sup>		•
Comparative Literature	• <sup>1</sup>			•
Computer Science		• <sup>2</sup>		•
Creative Writing and Writing for the Performing Arts			•	
Critical Dance Studies	• <sup>1</sup>			•
Economics	•			•
Education	•	M.Ed.		•
Electrical Engineering		• <sup>2</sup>		•
English	•			•
Entomology		•		•
Environmental Sciences		•		•
Environmental Toxicology		•		•
Ethnic Studies	• <sup>1</sup>			•
Evolution, Ecology, and Organismal Biology		•		•
Experimental Choreography			•	
Genetics, Genomics, and Bioinformatics		• <sup>1</sup>		•
Geological Sciences		•		•
History	•			•
Management		M.A. <sup>1</sup> , M.B.A.		•
Materials Science and Engineering		•		•
Mathematics	•	•		•
Mathematics, Applied		•		
Mechanical Engineering		• <sup>2</sup>		•
Microbiology		•		•
Music	•			•
Neuroscience		• <sup>1</sup>		•
Philosophy	•			•
Physics	•	•		•
Plant Biology		•		•
Plant Pathology		•		•
Political Science	•			•
Psychology	• <sup>1</sup>			•
Religious Studies	•			•
Sociology	• <sup>1</sup>			•
Southeast Asian Studies	•			
Spanish	•			•
Statistics		•		
Statistics, Applied				•
Visual Art			•	

<sup>1</sup> Applications are not accepted from students wishing to work toward the master's degree only.

<sup>2</sup> A combined B.S. + M.S. program is offered in this discipline (designed to lead to a B.S. degree as well as an M.S. degree in five years.)

support is January 5. These deadlines may vary somewhat by program, so applicants should not hesitate to contact programs directly for additional information. Please refer to *International Student Admissions* for information about international student deadlines.

A nonrefundable application fee must be submitted at the time of application: domestic applicants (U.S. citizens and permanent residents), \$80;

foreign applicants (nonimmigrant), \$100. The following must also be submitted:

1. Official transcripts from each college or university attended since high school
2. Three letters of recommendation
3. Graduate Record Examination (GRE) general test score is required by most programs

Some programs also require the appropriate GRE subject test. GRE scores are not required for the teacher education credential programs or the MFA programs in Creative Writing & Writing for the Performing Arts, Experimental Choreography, and Visual Art. The MBA program accepts either the Graduate Management Admission Test (GMAT) or the GRE. Test scores should not be older than five years. Please refer to *International Student Admissions* for information concerning proof of English proficiency for US citizens and US Permanent residents whose first language is not English and who have not earned an advanced degree at an institution where English is the exclusive language of instruction.

Domestic applicants whose first language is not English and who have not earned an advanced degree at an institution where English is the exclusive language of instruction must provide proof of English proficiency. Please see complete information below under *International Student Admission*.

## International Student Admissions

International students follow the same procedures and are governed by the same regulations as domestic applicants with the following exceptions.

Applicants whose first language is not English and who have not earned an advanced degree at an institution where English is the exclusive language of instruction must submit scores from the *Test of English as a Foreign Language (TOEFL)*. This exam is administered by the Educational Testing Service and offered in nearly every country abroad. The minimum acceptable scores are: 550 for the written exam; 213 for the computer-based exam, and 80 for the internet-based exam (iBT). Applicants should arrange to take the examination in their home country by contacting the following:

Educational Testing Service  
P.O. Box 6151  
Princeton, NJ 08540-6151  
<http://www.ets.org>

The TOEFL must be taken no more than two years prior to the intended quarter of enrollment.

Applicants may submit scores from the Academic Module of the *International English Language Testing System (IELTS)*. This exam also must be taken no more than two years prior to the intended quarter of enrollment at UCR. The minimum acceptable score is 7 with no score less than 6 on any individual component. Please request an official Test Report Form (TRF) from the test center where the test was taken.

International students must also complete a financial statement (provided on the application). The university will be unable to issue a Certificate of Eligibility (I-20 or DS2019) without evidence of the applicant's ability to pay all fees and expenses for the duration of the program of study.

Application deadlines for international students are April 1 (January 5 for admission with fellowship support) for the fall quarter, July 1 for the winter quarter, and October 1 for the spring quarter.

The International Education Center specializes in providing information and a broad range of services to international students and can be contacted at (951) 827-4113

## Reapplication

Students who have not maintained continuous enrollment or been approved for a leave of absence will lose their student status and will have to reapply to the University to continue in their degree programs. They should follow the same process as new students to apply for readmission. The Graduate Division will retain a student's file for five years. Students applying for readmission within that five year period will not have to provide the University with new transcripts if they have not enrolled elsewhere but may need to provide a new statement of purpose and letters of recommendation. Students who have been gone over five years must order transcripts from all former institutions attended.

Students will be held to the new catalog requirements at the time of readmission and will lose their candidacy when they fail to maintain continuous enrollment unless the Graduate Dean approves an exception. Students may return on filing fee status to graduate if they have not used it before and the Dean approves an exception and allows them to reenter under their original catalog requirements and approves their continued advancement to candidacy.

## Teaching Credential Programs

Prospective applicants to teaching credential programs should contact the Graduate School of Education, (951) 827-5225 for admission information and application materials or see Graduate School of Education later in this catalog.

## Degrees and Programs

The minimum requirements for master's and doctor of philosophy degrees are outlined below. Individual program requirements are described in the Programs and Courses section of this catalog.

## Foreign Language Requirement

Each program determines what, if any, knowledge of a foreign language or languages should be required of students pursuing graduate degrees. Proficiency in a foreign language may be demonstrated by (1) passing a written examination administered by the department or program or (2) successfully completing a course or courses specified by the program. With the support of the program and the approval of the graduate dean, students may receive credit for foreign language examinations or course work completed not more than four years before being admitted to graduate study at UCR.

## Professional Development Requirement

Professional development training is a requirement of all M.A., M.S., M.F.A., and Ph.D. programs. Training typically includes elements of research and professional ethics, grant and professional writing, strategies for success in graduate school and the profession, pedagogy, public speaking, career and job market guidance, and other relevant topics to help students become successful professionals. Each program determines the format, content, and extent of its training in order to make it specific to, and appropriate for, the discipline. A program may provide all of its training independently, or it may partner with other programs, or utilize services provided by other campus units or professional organizations.

Training must be for unit credit and may be delivered as a single course or as portions of multiple courses.

## Standards of Scholarship

Only courses in which grades of "A," "B," "C," or "S" are received may be counted toward satisfying graduate degree requirements. To continue in good standing and obtain an advanced degree, students must maintain a minimum GPA of 3.00 in all upper division and graduate level courses related to the degree. In addition, students must demonstrate acceptable progress toward their degree objectives. This entails the acceptable completion of all course work and other degree requirements in a timely fashion. Students are considered to be making unacceptable progress and become subject to dismissal when

- they have 12 or more units of "I" grades outstanding;
- the overall GPA falls below 3.00;
- the quarterly GPA falls below 3.00 for two consecutive quarters;
- they fail to fulfill program requirements such as exams or research in a timely and satisfactory manner;
- they have not completed their programs within one year after reaching the normative time; or
- they fail to pass comprehensive or qualifying examinations in two attempts;
- they fail to make progress in research for two consecutive quarters

## Satisfactory/No Credit (S/NC) Grading

Graduate students may take course work on an S/NC basis only when the course description indicates that this is an option. Students who wish to enroll in undergraduate courses on an S/NC basis may petition the Dean. The Graduate Advisor must certify that these courses are not in the student's major or program of study and these course work cannot be used for graduation. A grade of S is equivalent to a grade of B (3.0) or better but does not count towards the student's grade point average. No credit is given for a course in which a grade of NC is assigned.

## Repeating Courses

A graduate student may repeat only those courses in which a grade of D, F or NC was received. Repetition of a course more than once requires the Dean's approval. Only the most recently earned grade is used in computing the student's grade point average.

## Incomplete Grades

Most commonly, professors will grant an Incomplete if students were unable to take the final examination or finish a paper at the required time due to illness or other unavoidable problems that can be verified, providing the student's work in the course was of passing quality. In order to remove the "I", students must complete the work required during the next academic quarter (whether in attendance or not)—professors will then report the grade to the Registrar on a Grade Change Form. Incompletes cannot be removed by enrolling in the course during the following quarter. Make arrangements with your instructor on how to replace the "I" for a grade. The "I" will automatically revert to an "F" (or NC) after one quarter. PhD students cannot graduate with an "I" grade on their record. Master's students can only graduate with an "I" if they do not need the course for the degree and are continuing in the PhD program.

## Changing Grades

Grades are final at the end of each quarter. If you discover a clerical or procedural error was made in the posting of your grade, contact the instructor immediately and request a revision. This type of revision can be made only if: 1) the basis for the change is found in work which you submitted as part of the regular assignments during the quarter; 2) the change is not the result of re-examination (unless your initial grade was Incomplete); 3) the change does not involve a change in the grading basis (from S/NC to letter grade or the reverse). Only the instructor can change a grade.

## Appeal of Grades

The Regulations of the Riverside Division of the Academic Senate state that if a student believes that non-academic criteria have been used in determining a grade, the student shall attempt to resolve the grievance with the instructor of the course through written appeal to the instructor via the chair of the department. If the grievance is not resolved to the student's satisfaction at the departmental level, the student may file a complaint with the Dean of the Graduate Division. The complaint should be filed immediately after the alleged use of non-academic criteria but no later than six weeks after the beginning of the subsequent quarter. Non-academic criteria are criteria not directly reflective of class performance, such as discrimination on political grounds or for reasons of race, religion, sex, or ethnic origin or for other arbitrary or personal reasons.

## Exams

Only two attempts at major exams are allowed unless the program has special approval from the Graduate Council for additional attempts.

# Minimum Degree Requirements

## Master's Degree

The minimum required period of residence in the University is one academic year (3 quarters) of which two quarters must normally be spent at the University of California, Riverside. A candidate for a higher degree is regarded as a student in residence in a regular term only if he/she is actually enrolled in at least four units of upper division and/or graduate work; or, in a ten-week summer session at least four units.

The master's degree can generally be earned in one of two ways: by writing a thesis or by passing a comprehensive examination. Some programs offer only one of these options.

Both plans require a minimum of 36 quarter units of graduate (200 level) or upper-division (100 level) undergraduate work in the major subject or some other subject deemed relevant by the program faculty. Many programs have additional requirements. Courses at the 300 and 400 level do not count towards this minimum requirement.

Unless otherwise stated in the program description, the normative time required to complete the master's degree is two years.

**Plan I (Thesis)** requires that at least 24 units be in graduate (200) level courses taken at a University of California campus (see residency requirements). Of these, only 12 may be in graduate research for the thesis and, in most cases, none may be in courses numbered 291 (exam preparation). Students are guided by a committee of three faculty who must be approved by the Graduate Dean. In addition to requiring an acceptable thesis, the department may require any examination that it feels necessary to confirm that the student has an appropriate knowledge of the discipline. Once completed the thesis must adhere to University standards and be filed in the Graduate Division electronically.

**Plan II (Comprehensive Examination)** requires that at least 18 units be in graduate (200) level courses taken at a University of California campus (see residency requirements). None of these may be in graduate research for the thesis or, in most cases, in courses numbered 291 (exam preparation). Students must take a comprehensive examination, the content of which is determined by the department or program. No more than two attempts to pass the exam are allowed.

Master's students in residence and in good standing may earn course credit by examination. Consult the departmental graduate advisor for further details.

## Advancement to Candidacy in Master's Program

Students must file for advancement to candidacy no later than the first week of the quarter in which they expect to receive their degree. Some degree requirements may be in progress at that time. The forms for advancement to candidacy are obtained from [www.graduate.ucr.edu/advancement.html](http://www.graduate.ucr.edu/advancement.html) and filed in the Graduate Division after obtaining the graduate advisor's approval. In the event of some unexpected delay, students have up to one year from the completion date of all course requirements to complete their remaining academic requirements. Students must complete all requirements for the degree by the last day of the quarter in which they intend to graduate. Students cannot graduate with a GD or Incomplete grade unless they are continuing in a PhD program. Students must be enrolled or on filing fee status to complete degree requirements. If they were enrolled (or on filing fee status) every quarter of the previous academic year then they may complete during the summer without paying fees.

## Duplication of Degree

Permission to work for a second master's degree may be approved when there is little relation in content between the two degrees. Duplication of a master's degree in a single field is allowable only with permission of the Graduate Dean. Pursuit of a second doctorate is not permitted.

## Continuing from the Master's to the Doctorate

Students who are enrolled in a master's program may petition to pursue the

doctorate in their field of study. To do so, they should file a Change in Degree Objective Form with the Graduate Division while they are enrolled. Approval by the department is not automatic; the department determines whether or not each student has the academic potential to succeed in its Ph.D. program. This requirement for evaluating each student's potential and academic fitness to proceed toward the Ph.D. is enforced regardless of the student's initial degree objective at matriculation.

## Doctoral Degree

The minimum academic residence for the Ph.D. is six quarters at the University of California, three of which must be spent in continuous residence at UCR. The normative time required for the Ph.D. varies considerably and is given at the end of each program's description in the Programs and Courses section of this catalog. For the doctoral degree, normative time is defined as the period of full-time registration required to earn the degree. For most UCR programs, this is between five and seven years.

The doctorate, the highest degree the university can bestow, is a research degree, conferred on the recommendation of a doctoral committee, which is nominated in consultation with the student by the program faculty and confirmed by the Graduate Dean.

Because the Ph.D. is a research degree, the university gives programs considerable latitude in establishing degree requirements. The individual student's program of study is planned in consultation with the graduate advisor, who supervises the student's progress prior to the appointment of the doctoral committee.

A doctoral program generally involves two stages. The first stage is spent fulfilling the requirements established by the program or department and the Graduate Council, typically a series of courses culminating in written and oral qualifying examinations. When these are passed, the student is advanced to candidacy for the Ph.D.

The second, or in-candidacy stage, is devoted primarily to independent study and research and to the preparation of the dissertation. The doctoral dissertation must be an original work of research in the candidate's chosen field of specialization. The doctoral committee determines the acceptability of the dissertation and may require that the student defend its contents in a final oral examination.

## Candidate in Philosophy

A Ph.D. student who is advanced to candidacy and has to leave UCR without a degree may apply for the Candidate in Philosophy. This is awarded only to students leaving UCR without a master's or doctoral degree.

## Special Programs

### Teaching Assistant Development Program

UCR has a long history as a distinguished teaching campus and regards teaching assistant (TA) training as a crucial part of graduate instruction. The Teaching Assistant Development Program (TADP) sponsors activities designed to help TAs develop their teaching skills and prepare them to be successful professors. Activities include a fall orientation program, end-of-term student evaluations, annual awards for outstanding TAs, and a mentor program, in which TAs of proven ability have the opportunity to mentor their less experienced colleagues. They also sponsor a language learning lab for international students. Teaching assistants who score low on their student evaluations are required to attend workshops designed to improve their teaching methods and may be assigned a mentor to work with them individually.

### GradPREP

GradPREP ([www.gradprep.ucr.edu](http://www.gradprep.ucr.edu)) is a professionalization program that provides graduate students with a plethora of resources to empower their ability to perform as budding professionals. GradPREP encompasses the Graduate Student Resource Center ([www.gsrc.ucr.edu](http://www.gsrc.ucr.edu)); the Teaching Assistant Development Program ([www.tadp.ucr.edu](http://www.tadp.ucr.edu)); the University Teaching Certificate Program ([www.utc.ucr.edu](http://www.utc.ucr.edu)); the English Language Development Program for international TAs ([www.eldp.ucr.edu](http://www.eldp.ucr.edu)); the Graduate Student Mentoring Program ([www.gradmentors.ucr.edu](http://www.gradmentors.ucr.edu)); and the Graduate Writers Resource Center ([www.gwrc.ucr.edu](http://www.gwrc.ucr.edu)).

## Intercampus Exchange

The Intercampus Exchange Program (ICE) allows students to study for up to three quarters at another UC campus. To be eligible, students must be in good standing with at least one quarter in residence at UCR and demonstrate at least one of the following: the need to take a course or courses not offered at UCR, the need to study with a particular individual, or the need for continuous access to library holdings or other facilities not available at UCR.

## Education Abroad

The Education Abroad Program (EAP) provides students with the opportunity to study abroad at one of several study centers. To be eligible, students should have completed one year of graduate study, be making acceptable progress toward the degree, and know the language of the host country. Applications and information can be obtained from the International Education Center. Additional information can also be found in the Education Abroad Program sections of this catalog.

## Fees and Financial Support

See Fees and Expenses under the Finances and Registration section of this catalog for a list of estimated expenses and a schedule of mandatory quarterly fees. Deadlines for paying fees are published quarterly at [classes.ucr.edu](http://classes.ucr.edu).

Graduate students serving as teaching assistants or graduate student researchers (GSRs) who are appointed at 25 percent time (10 hours per week) or more qualify for a remission of the student services fee and tuition. Nonresident supplemental tuition is paid for nonresident GSRs who are appointed 45 percent time or more for an academic term, are not receiving any other form of support which pays the nonresident tuition, and who meet the eligibility requirements for the GSR title. Students should check with their departments for further information on these fee remissions.

All students who are considered nonresidents for tuition purposes and are advanced to candidacy for the Ph.D. on or before the first day of instruction will receive a reduction of 100 percent of the nonresident supplemental tuition. Each student is eligible for this reduced nonresident supplemental tuition rate a maximum of three calendar years. Time spent not registered (withdrawn, on leave, or filing fee status) will count toward the three-year total unless the Graduate Dean grants an exception. A student must be advanced by the first day of instruction to qualify for that term.

All graduate students are assessed a quarterly fee for a health insurance policy providing year-round and worldwide coverage (Graduate Student Health Insurance Plan—GSHIP). This insurance is designed to supplement outpatient care available to students through the Campus Health Center. This premium is paid for all teaching assistants, graduate student researchers, and readers/tutors employed 25 percent time or more. Students who can demonstrate to the Campus Health Center that they have comparable insurance from another source may obtain an exemption from the GSHIP premium. Students awarded the exemption have the GSHIP fee removed from their bill but do not receive any monetary compensation. Deadlines for applying for the exemption are firm.

Information regarding GSHIP benefits, claims, comparable coverage exemptions, and optional dependent coverage can be obtained from the Health Insurance Coordinator, Campus Health Center (951) 827-5683. More information about GSHIP remissions for teaching assistants and graduate student researchers is available from the Graduate Division, or a student's academic program.

Students who have not established legal residency in California must pay nonresident supplemental tuition. Regulations governing the determination of California residency are outlined in the Finances and Registration section of this catalog. All students will be assessed this fee until they are declared a resident by the Registrar's Office. Even those who were undergraduates at UCR must complete these forms.

The **Deferred Payment Plan** offers students an opportunity to pay their fees in three monthly installments. An application and fee must be submitted by the deadline set by the Student Business Services office. Students must apply each quarter and may apply through their GROWL accounts.

## Career Employees (Reduced Fee Program)

A student who is a career employee of the University may be eligible for a two-thirds reduction in fees through the Employee Reduced Fee Program. Contact the Benefits Office for more information ([hr.ucr.edu/education/benefits.html](http://hr.ucr.edu/education/benefits.html)). Because employees already have health insurance they should contact the Campus Health Center about obtaining an exemption from GSHIP.

## Fellowships

Fellowships are awarded on the basis of scholarly achievement and promise. Students apply to their prospective programs, which then nominate the most qualified applicants. Recipients must complete a full-time program of study or research each quarter, maintain a GPA of 3.00 or better, have no more than 7 units of "Incomplete" grades, be advanced to candidacy for the Ph.D. within 12 quarters after entry (unless the award letter specifies a different date), and be making acceptable progress toward their degrees. Fellowships are offered only to full-time students pursuing degrees. Full-time UCR employees, credential and non-degree objective students are not eligible for fellowships. Full-time UCR employees may apply for reduced fees (see above).

Fellowship holders may supplement their awards with employment, with the prior approval of the Graduate Dean. Supplementation levels vary with the type and amount of fellowship award.

## Teaching and Research Assistantships

Graduate students may be employed by the university on a part-time basis (not to exceed 50 percent time, or 20 hours per week) during the academic year. Students who hold assistantships must register for and complete a full program of study or research and remain in good standing for the duration of their employment. Students are responsible for reviewing their course enrollment to ensure that they are enrolled in at least 12 units. They may not have more than 7 units of "Incomplete" grades and must be advanced to candidacy within 12 quarters after entry to the Ph.D. program. Fifty percent time teaching assistantships provide a salary of \$5656.50 per quarter. TAs are appointed through their departments and must maintain a GPA of 3.00 or better and be making acceptable progress toward their degree. Any student whose native language is not English must pass a test of spoken English (TOEFL-iBT or SPEAK test) before performing TA duties. No one may serve in teaching title codes (TA, Fellow, Associate In) for more than 18 quarters.

The salary for research assistantships at 49 percent time begins as \$4280.60 per quarter. Graduate student researchers (GSRs) can also be paid on a full-time basis for up to three months during the summer. To be appointed to and retained as a GSR, students must maintain a GPA of 3.00 or better and be making acceptable progress toward the degree. GSR appointments are made through the department or program.

## Loan Programs

Federal Direct Stafford Loans and Federal Direct Unsubsidized Stafford Loans are available to graduate students through the Financial Aid Office. Students should contact the Financial Aid Office or check [www.finaid.ucr.edu](http://www.finaid.ucr.edu) for a FAFSA if they want to be considered for these federal loan funds.

## Research Grants

**Dissertation Research Grants** provide funds to doctoral candidates for research-related expenses associated with the dissertation. Applicants must be advanced to candidacy and plan to be registered during the period of the award. Proposals may be funded up to a maximum of \$1,000. Applications are available at [http://graduate.ucr.edu/list\\_finaid.html](http://graduate.ucr.edu/list_finaid.html).

**The Master's Thesis Research Grant** is for students enrolled in the Anthropology (M.S. degree only), Art History, Creative Writing and Writing for the Performing Arts, Experimental Choreography, Southeast Asian Studies, and Visual Arts for the purposes of expenses directly related to thesis research. Applications are available at [http://graduate.ucr.edu/list\\_finaid.html](http://graduate.ucr.edu/list_finaid.html).

**Graduate Student Association Conference Travel Grants** help to meet the financial needs of students who have been invited to present scholarly

papers or posters at regional and national professional conferences. The program, administered by the UCR Graduate Student Association, funds both conference attendees and presenters, with attendees reimbursed at one half the rate of presenters. The percentage of reimbursement is set monthly and is based on the volume of applications received.

**UC Graduate Fellows in the Humanities** are one-quarter fellowships for exceptional graduate students in the humanities who have advanced to candidacy and are in the final stages of completing their dissertations. The award is a \$4,500 stipend with payment of campus-based fees and health insurance for the quarter. Support from this fellowship program does not preclude support from the Graduate Division's Dissertation Fellowship competition. For more information go to: <http://chass.ucr.edu/research/student.html>.

### Humanities Graduate Student Research Grants

The Humanities Graduate Student Research Grants financially assist graduate students doing original research or creative projects in the humanities, as broadly defined by the National Endowment for the Humanities. Awards are up to \$1500. The grant period runs from May through April. Extensions of the grant period should be requested in writing. Awards terminate upon leaves of absence, filing fee status, withdrawal or graduation. A student must be registered in the Spring Quarter to use these funds during the summer months. For more information go to:

<http://chass.ucr.edu/research/student.html>

## Registration, Enrollment and Transfer of Credit

### Continuous Registration

Unless a leave of absence has been granted, students must register for every academic quarter once their graduate studies begin. Students must either be registered or on filing fee status in the quarter in which the degree is awarded. If a student was enrolled or on filing fee status every quarter of the previous academic year, then they may complete their degree during the summer without paying fees.

### Filing Fee Status

Students who have completed all degree requirements except for filing their dissertations/theses or sitting for their master's comprehensive examinations are eligible for filing fee status during the final quarter of residence. For students writing dissertations or theses, the student's committee must have read and approved a draft of the manuscript, with only minor revisions remaining.

Students on filing fee status pay only one-half of the student services fee. Because filing fee status is tied to that fee, it can vary from quarter to quarter. See [classes.ucr.edu](http://classes.ucr.edu) for information on fees. Only one quarter on filing fee status is allowed, unless a student fails the master's comprehensive exam. Then a retake of the exam on filing fee status is allowed. Students who fail to complete their degree programs by the appropriate deadline while on filing fees status must register and pay full fees for the following quarter.

### Leave of Absence

A leave of absence is intended to allow the temporary interruption of the student's academic program. Leaves are granted for the following reasons:

1. Serious illness or other temporary disability
2. The need to concentrate on a job or occupation not directly related to the degree program
3. Family responsibilities

To be eligible for a leave of absence, students must have the approval of their graduate advisors, be in good standing, and have been enrolled for at least one quarter. Leaves are not normally granted for more than one year. Since students on leave do not pay fees, they may not use university facilities or make demands on faculty time. Students on leave are ineligible for fellowships, research grants, and financial aid. Appointment as a graduate

student researcher or teaching assistant, or any other appointment requiring full-time enrollment, is not possible. Nor can students on leave take qualifying examinations or receive credit for academic work done during the leave period.

### In Absentia Registration

Students pursuing graduate study or research outside the state of California for an entire quarter may register *in absentia* and receive an 85 percent reduction in the student services fee and tuition. Refer to the Finances and Registration section of this catalog for a schedule of fees. *In absentia* registrants are normally advanced to candidacy for the doctorate; master's candidate are normally in the stage of researching the master's thesis.

### Withdrawal

Students who withdraw during the first five weeks of a quarter are entitled to a partial refund of fees. The amount of the refund is determined by the number of calendar days elapsed between the first day of instruction and the date on which a withdrawal form is filed with the Graduate Division. See the Schedule of Refunds in the Finances and Registration section of this catalog. Students who have applied for the Deferred Payment Plan are considered registered students and are held to the same refund schedule.

Students who are unable to file the necessary paperwork due to illness or emergency should call the Graduate Division at (951) 827-3315..

### Lapse of Candidacy

Candidacy for the degree may lapse after withdrawing or failing to register at the end of a leave of absence.

### Enrollment

Each quarter, graduate students must pay their fees and enroll by the date indicated at [classes.ucr.edu](http://classes.ucr.edu). Course schedules require the prior approval of the departmental graduate advisor.

All graduate students are expected to carry a full academic course load unless good reasons exist for not doing so. Graduate students are considered to be full time if they are carrying 12 graduate units. When a course program contains both graduate and undergraduate courses, the table on this page is used to calculate the appropriate course load.

### Part-Time Study and Reduced Fees

The regulations regarding a reduction in fees for attending part-time is set by the Office of the President. It is only approved for students who cannot attend full-time for reasons of occupation (full-time employment outside the university), unusual family responsibilities, or poor health. Students

they do not meet the requirements of the Employee Reduced Fee Program. International students should be aware that federal regulations governing student visa status require full-time attendance. University financial aid is not available for students taking less than six units of course work. Eligibility for deferment of student loan repayment obligations may be in jeopardy as well. Students should consult the Student Business Office of the University where they incurred their debt for specific information.

The application must be submitted to the Graduate Division two weeks before fees are due unless students want to pay their full fees first. If full fees are paid first, a refund will be processed. In no event may the student turn in a petition after the third week of the quarter

### Transfer of Credit

A maximum of 8 quarter units from institutions outside the University of California may be counted towards the master's degree at UCR. All transfer work must have been completed in graduate standing with a minimum grade of "B." Units cannot be transferred if the student earned a degree. These units may not be used to reduce the minimum number of graduate level units required (24 units required for the thesis plan and 18 units required for the comprehensive exam plan).

Department and Graduate Division approval must be obtained before these units can be accepted for credit. Units are transferred as "Satisfactory" (S) with no grade point value.

Since doctoral students do not have a strict unit requirement they do not need to transfer in units.

UCR undergraduates who have no more than two courses or 8 units of course work remaining in their bachelor's programs and who have been admitted to graduate status may begin course work for their advanced degrees at the beginning of the final quarter of undergraduate study. Transferring units from undergraduate status is called backdating and it requires that students inform their college offices before beginning course work and that they petition the Graduate Division for credit once they are enrolled as graduate students.

Students may apply summer sessions course work from any UC campus toward their graduate degree requirements if they have the prior approval of their departments and of the Graduate Dean.

Units from another UC campus may be used to satisfy one of the three quarters of the residence requirement and may be counted for up to one-half of the total units required for the UCR master's degree. Department and Graduate Division approval must be obtained before such units can be accepted for credit. Units cannot be transferred if the student has earned a degree from that campus.

In addition, students may transfer up to 8 units of concurrent enrollment credit. Concurrent enrollment means that a student took regularly scheduled UCR classes but was not an admitted student and paid for the class through UCR Extension. Students must have taken these units before their enrollment as graduate students. Matriculated graduate students (including students on leave of absence) may not enroll in course work through Extension without the Graduate Dean's approval. Graduate students who withdraw before completing their program objectives, then take courses through Extension are required to wait one year before applying courses to their degrees. Grades from UCR Extension courses will be recorded on student transcripts

### Waiving Course Work

All substitutions or waivers of degree requirements must be reviewed by the Graduate Adviser and approved by the Graduate Dean. Waiver of course work will not reduce the minimum number of units required for a master's degree.

Full Academic Program				
Graduate Units	+	Undergraduate Units	=	Fulltime
0	+	16	=	Fulltime
1	+	15	=	Fulltime
2	+	13	=	Fulltime
3	+	12	=	Fulltime
4	+	11	=	Fulltime
5	+	9	=	Fulltime
6	+	8	=	Fulltime
7	+	7	=	Fulltime
8	+	5	=	Fulltime
9	+	4	=	Fulltime
10	+	3	=	Fulltime
11	+	2	=	Fulltime
12	+	0	=	Fulltime

may not be advanced to candidacy for the PhD and can only enroll in 6 units or less. Employees may not apply for this reduction in fees unless

# Colleges and Academic Programs

## College of Humanities, Arts, and Social Sciences

Student Academic Affairs  
3400 Humanities and Social Sciences  
University of California, Riverside  
Riverside, CA 92521  
(951) 827-3683; fax (951) 827-5836  
[chass.ucr.edu](http://chass.ucr.edu)

The degree programs in the College of Humanities, Arts, and Social Sciences are designed to introduce students to both the breadth and depth of the university's curriculum. This is accomplished by combining a wide distribution of courses with the opportunity to concentrate on course work in depth in a selected field. To achieve the first goal, students are required to take a wide range of lower-division courses that explore the diversity of human knowledge. In the upper-division curriculum, students are relatively free to concentrate in depth in their major field of interest.

### The Gateway to CHASS

Every year, an eminent UCR scholar leads 130 freshmen through the ideas and complexities of the annual CHASS theme while introducing students to university life. Students join The Gateway to CHASS Learning Community by simultaneously enrolling in CHFY 010 (The Gateway to CHASS -Lecture), a teaching assistant-led discussion section, a peer mentor-led workshop, and the appropriate Freshman Composition course. Learning Communities encourage students to explore a range of ideas through reading, writing, and discussions while fulfilling college breadth requirements. Students also work with peer mentors who help them negotiate the transition from high school to the university.

**Course Description** The Gateway to CHASS theme for 2011 is **Sustainability**. Anthropology professor Juliet McMullin, author of, *The Healthy Ancestor* and co-editor of *Confronting Cancer*, argues Sustainability has increasingly become a catch phrase for a host of issues concerned with the degradation of natural and social ecologies. But what does it mean to say that we are concerned with enabling intersecting arenas that range from the environment, development, and human health to endure? In what ways do historical, political, economic, and socio-cultural processes give meaning to a conversation about sustainability? And how do subsequent efforts to enact the values of sustainability achieve specific goals while obscuring other social relationships? By bringing an anthropological lens to this diverse conversation, this course will examine the cultural processes involved in contemporary sustainability practices and projects, the social relationships involved in making these efforts work, and what anthropological knowledge can contribute to these efforts. Specific topics to be explored include an emphasis on food security, health, the built environment, social justice, and room for new issues to emerge from our class conversations.

### Majors

A major is a coordinated group of upper-division courses (courses numbered 100-199) in a field of specialization. The major may be a program of upper-division courses within a single department (departmental major), a group of related courses involving a number of departments (interdisciplinary major), or a group of courses chosen to meet a special interest (Humanities, Arts, and Social Sciences individual major).

Before enrolling in certain upper-division courses, students may be required to gain appropriate knowledge by completing specific prerequisite courses. With the assistance of a departmental advisor, students are expected to select lower-division courses that prepare them for the advanced studies they propose to follow.

### Choosing a Major, Undeclared Majors

While freshmen may choose an academic major on entering UCR, those who are unsure about specific academic goals may request to be admitted to the college as undeclared. These students often take introductory courses in the natural sciences, social sciences, humanities, and fine arts while searching for an area that most excites their interest. Undeclared majors are encouraged to meet with an advisor in the Student Academic Affairs Office about their selection of courses.

Students with 90 or more units toward a degree must declare a major. To declare a major, students must obtain approval from the department offering the major and from the Student Academic Affairs office. Students who do not declare a major by 90 or more units may have a hold placed on their registration.

If undeclared majors feel that their interests lie primarily in the areas of the natural sciences, mathematics, and statistics, or the agricultural sciences, advising can be obtained in the College of Natural and Agricultural Sciences, (951) 827-7294. Those interested in engineering or computer science can be advised in the Bourns College of Engineering (951) 827-ENGR (3647). The college does not allow students to work toward admission into the College of Natural and Agricultural Sciences or the Bourns College of Engineering. They should make progress toward a CHASS major, unless they are pursuing double majors or baccalaureates.

### Double Majors

Students can declare a second major within the College of Humanities, Arts, and Social Sciences or a second major in a department or program of another college. Changes are not permitted while on academic probation or during the final senior year (135 units or more). Both majors must be completed within the maximum limit of 216 units, and approval must be obtained from advisors in both departments or programs. In such cases, all course requirements must be completed for each of the two majors chosen. One of the two majors must be designated as the primary major for the purpose of satisfying breadth or general education requirements. No more than 8 upper-division units may count for both majors simultaneously.

A declaration of two majors in different colleges must be signed by the deans of the colleges concerned and filed by the student with the college of the principal major. If the two majors lead to different degrees (B.S. and B.A.), that fact will be noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements for both majors must be met.

Students wishing to declare a second major must present an outline to the Student Academic Affairs Office, indicating which major will be used to satisfy breadth requirements and any overlap courses between the two majors.

### Interdisciplinary, Individual Majors

**Humanities, Arts, and Social Sciences Interdisciplinary Major** offers courses of broad interest, and students with interests not readily satisfied through existing departments and programs may develop individual majors under the direction of special faculty sponsors. The consent of the Humanities, Arts, and Social Sciences Interdisciplinary Program Committee and the associate dean are required. The title of the major will be entered on the official degree list and on the official transcript. Diplomas will read "Humanities, Arts, and Social Sciences Interdisciplinary" with the individual field of concentration specified.

**Liberal Studies Major** Students planning to become elementary school teachers should consider declaring the Liberal Studies Major. The lower-division core of courses prepares students with subject matter preparation in the required subjects of the California Department of Education K-6 Frameworks. The upper-division requirements introduce students to academic areas that provide them with better preparation in meeting No Child Left Behind criteria.

## College of Humanities, Arts, and Social Sciences Undergraduate Majors and Options

Administrative Studies <sup>1</sup> (major with Art History, B.A.; Economics, B.A.; History, B.A.; Political Science, B.A.; and Sociology, B.A., B.S.)	B.A.		Languages and Literatures/Germanic Studies	B.A.
African American Studies	B.A.		Languages and Literatures/Languages	B.A.
Anthropology (also major with Law and Society, B.A.)	B.A.	B.S.	Latin American Studies	B.A.
Art (Studio)	B.A.		Law and Society <sup>1</sup> (major with Anthropology, B.A.; Economics, B.A.; History, B.A.; Philosophy, B.A.; Political Science, B.A.; Psychology, B.A.; and Sociology, B.A., B.S.)	B.A.
Art History (also major with Administrative Studies, B.A.; and Religious Studies, B.A.)	B.A.		Liberal Studies	B.A.
Asian American Studies	B.A.		Linguistics	B.A.
Asian Literatures and Cultures	B.A.		Media and Cultural Studies	B.A.
Asian Studies	B.A.		Music	B.A.
Business Economics	B.A.		Music and Culture	B.A.
Chicano Studies	B.A.		Native American Studies	B.A.
Classical Studies	B.A.		Neuroscience	B.A. B.S.
Comparative Ancient Civilizations	B.A.		Philosophy (also major with Law and Society, B.A.)	B.A.
Creative Writing	B.A.		Political Science (also majors with Administrative Studies, B.A.; International Affairs, B.A.; Law and Society, B.A.; and Public Service, B.A.)	B.A.
Dance	B.A.		Psychology (also major with Law and Society, B.A.)	B.A. B.S.
Economics (also majors with Administrative Studies, B.A.; and Law and Society, B.A.)	B.A.		Public Policy	B.A.
English	B.A.		Religious Studies (also major with Art History, B.A.)	B.A.
Ethnic Studies	B.A.		Russian Studies	B.A.
Global Studies	B.A.		Sociology (also majors with Administrative Studies, B.A., B.S.; and Law and Society, B.A., B.S.)	B.A. B.S.
History (also majors with Administrative Studies, B.A., and Law and Society, B.A.)	B.A.		Spanish	B.A.
Humanities, Arts, and Social Sciences Interdisciplinary Interdisciplinary Studies <sup>2</sup>	B.A.		Theatre	B.A.
Languages and Literatures/Comparative Literature	B.A.		Women's Studies	B.A.
Languages and Literatures/French	B.A.			

<sup>1</sup> Only offered as a major combined with other programs.

<sup>2</sup> New student registration in this program is not open at present.

### Disciplinary Minors

African American Studies <sup>3</sup>	History
Anthropology	Music
Art History	Native American Studies <sup>3</sup>
Asian American Studies <sup>3</sup>	Neuroscience
Chicano Studies <sup>3</sup>	Philosophy
Classical Studies	Political Science
Creative Writing	Psychology
Dance	Religious Studies
Economics	Russian Studies
English	Sociology
Ethnic Studies	Spanish
French	Theatre
Germanic Studies	Women's Studies

### Interdisciplinary Minors

Arabic Studies	Lesbian, Gay, Bisexual, Intersexual, and Transgender Studies
Asian Studies	Marxist Studies
Asian Literatures and Cultures	Media and Cultural Studies
Chicano Bilingual-Bicultural Studies	Middle East and Islamic Studies
Global Studies	Peace and Conflict Studies
International Relations	Public Policy
Italian Studies	Urban Studies
Journalism	Western American Studies
Labor Studies	
Latin American Studies	
Law and Society	

The disciplinary and interdisciplinary minor requirements of Asian Studies and Latin American Studies are described in the Programs and Courses section under the appropriate department or program. For a description of the other interdisciplinary minors, see individual listings in the Programs and Courses section.

<sup>3</sup> See Ethnic Studies for descriptions of these minors.

This major achieves the goal of a rigorous major while providing prospective teachers with the broad undergraduate education required for elementary school teaching. See information on these programs in the Programs and Courses section of this catalog. Several of the college's regular major programs have an interdisciplinary emphasis that allows examination of a particular problem, theme, or area from a variety of perspectives.

### Internships, Independent Projects and Student Research

The Humanities, Arts, and Social Sciences student can often practice the subject, as well as read about it. Many undergraduates have the opportunity to work with a faculty member on a research project, and many departments

offer field work and internship courses. In these courses, students combine several hours per week of experience in an agency or firm with study of related academic materials and participation in a seminar, where formal knowledge and practical experience are related to one another. Internship experiences are regularly available in settings such as public and business administration, politics, environmental protection, social welfare, criminal justice, clinical and other psychology programs, museums and archival installations, newspapers, and art galleries.

Normally, each local internship does not count for more than 4 or 5 units in a single term, larger numbers of units being reserved for quarter-away internships. Petitions for credit beyond 5 units in a single quarter for a local internship must have the sponsoring agency's approval and a written

justification by the student's faculty sponsor. All such requests require the associate dean's approval.

A maximum of 16 units of credit toward the bachelor's degree may be obtained through internship courses, with a maximum of 12 units of internship scheduled in a single quarter for quarter-away situations. Students who are on academic probation may not enroll in internship courses.

### Transfer of Majors, Changing Majors

Students in good academic standing can petition to transfer from another college to the College of Humanities, Arts, and Social Sciences or from one major to another within the college, with the following restrictions: only students with 75 or fewer units can enter undeclared or pre-business; students with more than 75 units must declare a major upon admission to the college. The petition must be approved by the Student Academic Affairs Office before the change can be processed by the Office of the Registrar. Changes are not permitted while on probation or during the final senior year (135 units or more).

Students who fail to attain a GPA of 2.00 ("C") in preparation for the major or courses required for the major may be denied the privilege of entering or continuing in that major.

### Minors

The College of Humanities, Arts, and Social Sciences offers minor programs; however, no student is required to take a minor. Minors are not degree-granting majors; they are sequences of supplemental courses designed to enhance work in certain areas. Any minor may be taken jointly with any departmental or interdepartmental major. Minors in the college shall consist of not fewer than 16 nor more than 28 units of organized upper-division course work. No overlap may occur among courses used to satisfy upper-division course requirements for a major and a minor. A GPA of at least 2.00 is required in upper-division courses in the field of the minor.

A minor is a set of courses focused on a single discipline or an interdisciplinary thematic area. There can be no substitution for the courses listed as constituting a minor without approval of the governing department or committee. There is no limit on the number of minors a student can declare. Students must declare the minor(s) before their final degree check before graduation by completing a petition with the Student Academic Affairs Office in the College of Humanities, Arts, and Social Sciences, the College of Natural and Agricultural Sciences, or the Bourns College of Engineering, depending on their major. Prior approval by the department or committee offering the minor is required. The minor is noted on the transcript at the time the degree is conferred.

### University Honors Program

For a description of the University Honors Program, see Educational Opportunities in the front of this catalog. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section.

### Undergraduate Pre-Business Program

Pre-Business is a two-year program that prepares students to apply to the Business Administration major. Students who elect Pre-Business are advised in the College of Humanities, Arts, and Social Sciences during their freshman and sophomore years. Students who elect Pre-Business must gain admission to Business Administration by the time they have earned 90 units.

### Degree Requirements

Students in the College of Humanities, Arts, and Social Sciences must meet three levels of requirements for the Bachelor of Arts or Bachelor of Science degree: general university requirements, college requirements, and major requirements.

### General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section. In addition, the College of Humanities, Arts, and Social Sciences has the following requirements and limitations.

### Unit Requirements

Students must satisfactorily complete for credit a minimum of 180 units for the bachelor's degree. A maximum of 216 units is allowed. After having credit for 216 units, students are not permitted to continue except in cases approved by the associate dean in which specific academic or professional reasons are involved.

### Credit Limitations

Transfer students with credit from other institutions (advanced standing credit), receive a transfer profile from the Office of Undergraduate Admissions. The Student Academic Affairs Office evaluates the course work, indicating how the transferable credits are applied toward the degree. However, the following credit limitations may reduce the total number of units which apply toward the degree in the College of Humanities, Arts, and Social Sciences. Students should meet with an academic advisor in their major for questions regarding transfer credits.

The following credit limitations apply for all students enrolled in the college:

1. After completing 105 quarter units at a community college, students are not allowed further units for courses completed at a community college.
2. No more than 6 units in physical education activity courses may be applied toward the 180-unit requirement for the bachelor's degree.
3. No 400 series courses and not more than three courses in the 300 series of courses may be counted toward the 180 unit requirement for the bachelor's degree.
4. No more than 5 units of credit may be taken per quarter in special studies courses. See specific restrictions under each departmental listing regarding credit toward the major in special studies courses.

### College Breadth Requirements

The Student Academic Affairs Office, in consultation with the Executive Committee of the College of Humanities, Arts, and Social Sciences, determines which courses apply to the following requirements. It is the student's responsibility to verify those courses that fulfill these subject requirements. To search for courses that meet specific breadth requirements, visit [classes.ucr.edu](http://classes.ucr.edu).

Courses taken in the department or program of a student's major (including courses cross-listed with the major) may not be applied toward the breadth requirements except for History majors in connection with the World History requirement, English majors in connection with the English Composition requirement, Ethnic Studies majors in connection with the Ethnicity requirement, and foreign language majors in connection with the Foreign Language requirement. However, courses outside the major discipline, but required for the major, may be applied toward satisfaction of these requirements. Students who elect a double major may apply courses in one of the majors toward satisfaction of the breadth requirements.

For the following requirements, a course is defined as a block of instruction which carries credit of 4 or more units.

No course may be applied to more than one breadth requirement, with the exception of the course taken to meet the Ethnicity requirement. Internship and independent studies courses may not be used to satisfy breadth requirements.

Courses offered by or cross-listed with Business Administration, Education, and Physical Education may not be used to satisfy breadth requirements.

## College of Humanities, Arts, and Social Sciences Breadth Requirement Unit Summary

### For the B.A.

English Composition	Varies
Humanities	20
Social Sciences	16
Ethnicity (4 units) <sup>1</sup>	—
Foreign Language (level 4)	16
Natural Sciences and Mathematics	20
Total Units	72 plus English Composition

### For the B.S.

English Composition	Varies
Humanities	20
Social Sciences	16
Ethnicity (4 units) <sup>1</sup>	—
Foreign Language (level 3)	12
Natural Sciences and Mathematics	20
Total Units	68 plus English Composition

<sup>1</sup>The 4-unit ethnicity requirement can be applied to either the Humanities or Social Sciences requirement, depending on content.

## English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college level instruction in English Composition with no grade lower than “C.” Courses that the Academic Senate designates as alternatives to English 1C may be applied toward satisfaction of the third quarter of the writing requirement if students earn a “C” or higher.

Students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and ENGL 001A, ENGL 001B, ENGL 001C (or an alternative designated by the Academic Senate) is completed with satisfactory GPA.

Transfer students who have credit for one semester of English Composition from another institution are required to take two additional quarters, i.e., ENGL 001B and ENGL 001C.

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy ENGL 001A; they must complete ENGL 001B and ENGL 001C.

Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied ENGL 001A and ENGL 001B; they must complete ENGL 001C.

## Humanities: 20 units

### For the B.A. degree

- One course in World History (At UCR, courses that satisfy this requirement are HIST 010 or HIST 015 or HIST 020.)
- One course in the Fine Arts (Art, Art History, Dance, Media and Cultural Studies, Music, Theatre, or Creative Writing courses in poetry, fiction, or playwriting)
- Two courses from among the following:
  - Literature (offered by the departments of English, Comparative Literature and Foreign Languages, Hispanic Studies)
  - Philosophy
  - Religious Studies
- One additional course from the following:
  - History, the Fine Arts, Literature, Philosophy, Religious Studies
  - A foreign language at level 3 or higher (Courses used in fulfillment of

the foreign language requirement may not be used to meet this requirement.)

- A humanities course offered by Ethnic Studies; Creative Writing (courses in journalism); Humanities, Arts, and Social Sciences Interdisciplinary; Latin American Studies; Linguistics; or Women’s Studies

### For the B.S. degree

- One course in World History (At UCR, courses that satisfy this requirement are HIST 010, HIST 015, or HIST 020.)
- One course from the following:
  - Fine arts (Art, Art History, Dance, Media and Cultural Studies, Music, Theatre, Creative Writing courses in poetry, fiction, or playwriting)
  - Literature (taken in the departments of English, Comparative Literature and Foreign Languages, or Hispanic Studies)
  - Philosophy
  - Religious Studies
- Three additional courses from the following:
  - History, the Fine Arts, Literature, Philosophy, Religious Studies
  - A foreign language at level 3 or above (Courses used in fulfillment of the foreign language requirement may not be used to meet this requirement.)
  - Humanities courses offered by Ethnic Studies; Creative Writing (courses in journalism); Humanities, Arts, and Social Sciences Interdisciplinary; Latin American Studies; Linguistics; or Women’s Studies

## Social Sciences: 16 units

- One course in Economics or Political Science
- One course in Anthropology, Psychology, or Sociology
- Two additional social science-related courses from Comparative Ancient Civilizations, Ethnic Studies; Environmental Sciences; Geography (cultural geography courses); Human Development; Humanities, Arts, and Social Sciences Interdisciplinary; Women’s Studies; or one of the disciplines in 1. or 2. above

## Ethnicity: 4 units

One course focusing on the general concepts and issues in the study of race and ethnicity in California and the United States. Courses that satisfy this requirement must concentrate on one or more of four principal minority groups (African American, Asian American, Chicano/Latino, and Native American). These courses must be comparative in nature, analyzing the minority group experience within the present and historical context of other racial and ethnic groups, such as European-American minorities. The courses are to be offered by or cross-listed with the Department of Ethnic Studies.

Refer to the Programs and Courses section for the courses that fulfill the Ethnicity requirement.

## Foreign Language

Courses in American Sign Language may be used to meet this requirement.

### For the B.A. degree: course level 4 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by majoring in one or more languages) by completing the fourth-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of “C” or by demonstrating proficiency at the fourth-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student’s UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit [placementtest.ucr.edu](http://placementtest.ucr.edu) for dates and locations). Credit will be allowed only at the course level for which they qualify according to the placement exam.

### For the B.S. degree: course level 3 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by

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majoring in one or more languages) by completing the third-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of “C” or by demonstrating proficiency at the third-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student’s UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit [placementtest.ucr.edu](http://placementtest.ucr.edu) for dates and locations). Credit will be allowed only at the course level for which they qualify according to the placement exam.

### Natural Sciences and Mathematics: 20 units

1. One course in Mathematics, Statistics, or Computer Science
2. One course in Biological Sciences (Biochemistry, Biology, Botany and Plant Sciences, Entomology, Nematology, or Plant Pathology)
3. One course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural Geography courses)
4. Two additional courses from the areas listed above or in physical and/or biological science courses offered in the Department of Environmental Sciences

### New General Education Concentration Options

Students who choose to satisfy Breadth with the new General Education Concentration Option may choose either the California Concentration, the Climate Change/Sustainability Concentration, or the Ecology/Biodiversity Concentration listed below. One of these concentrations satisfies campus breadth requirements.

#### English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college level instruction in English Composition with no grade lower than “C.” Courses that the Academic Senate designates as alternatives to English 1C may be applied toward satisfaction of the third quarter of the writing requirement if students earn a “C” or higher.

Students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and ENGL 001A, ENGL 001B, ENGL 001C (or an alternative designated by the Academic Senate) is completed with satisfactory GPA.

Transfer students who have credit for one semester of English Composition from another institution are required to take two additional quarters, i.e., ENGL 001B and ENGL 001C.

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy ENGL 001A; they must complete ENGL 001B and ENGL 001C.

Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied ENGL 001A and ENGL 001B; they must complete ENGL 001C.

### General Education Options

#### A. California Concentration (Total units: 36-37)

1. ENGL 012B; AHS 021; STAT 040, MATH 004 or MATH 005 (12-13 units)
2. Two of: BPSC 021, BPSC 031, GEO 004 (8)
3. ETST 135 or ETST 154 (4)
4. HIST 138 or HIST 140 (4)
5. POSC 198-I (4)
6. HASS 190 (4)

#### B. Climate Change/Sustainability Concentration (Total units: 40-41)

1. GEO 011 (4 units)
  2. Two of: ENSC 002, BIOL 003, GEO 002, PHYS 018 (8)
  3. Two of: ENGL 012B, AHS 021, CPLT 025 (8)
  4. STAT 040, MATH 004 OR MATH 005 (4-5)
  5. Two of: PHIL 117, ANTH 132 or ANTH 137, GEO 160 (8)
  6. GEO 198-I (4)
  7. GEO 190 (4)
- C. Ecology/Biodiversity Concentration (Total units: 44-48)
1. Introductory Courses: ENSC 001 or CHFY 001E (4-5)
  2. Two of: ENTM 010, BIOL 010/GEO 003, BIOL 003, BPSC 021
  3. Two of: ANTH 020, ENGL 012B, CHFY 001-I, AHS 021, SOC 001 and MATH 004/MATH 005/STAT 040 (or any other MATH/STAT course)
  4. One of: PHIL 117\*, CRWT 146H\*, ENGL 141 (E-Z), HIST 105, HIST 107
  5. One of: ANTH 132, SOC 125\*, SOC 184\*
  6. One of: BIOL 152/GEO 152\*, GEO 153\*, GEO 167\*, GEO 169\*
  7. Internship: GEO 198-I or HASS 198-I (or equivalent course as approved by advisor)
  8. Capstone Course: HASS 190/193 (or equivalent course as approved by advisor)

\*Prerequisites: In each case, there are no more than one. Upper-division courses not starred require upper-division standing or consent of instructor.

### Ethnicity: 4 units

Unless otherwise noted, students taking a new General Education Concentration Option will still have to satisfy the campus Ethnic Studies requirement.

### Foreign Language

Courses in American Sign Language may be used to meet this requirement.

#### For the B.A. degree: course level 4 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by majoring in one or more languages) by completing the fourth-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of “C” or by demonstrating proficiency at the fourth-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student’s UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit [placementtest.ucr.edu](http://placementtest.ucr.edu) for dates and locations). Credit will be allowed only at the course level for which they qualify according to the placement exam.

#### For the B.S. degree: course level 3 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by majoring in one or more languages) by completing the third-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of “C” or by demonstrating proficiency at the third-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student’s UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit [placementtest.ucr.edu](http://placementtest.ucr.edu) for dates and locations). Credit will be allowed only at the course level for which they qualify according to the placement exam.

Note, in order to be enrolled in one of the concentrations, students must first see their academic advisor and then receive written approval from Professor George Haggerty, chair of the General Education Advisory Committee.

## Major Requirements

Detailed requirements for each major can be found under the department or program listing in the Programs and Courses section of this catalog.

A major in the College of Humanities, Arts, and Social Sciences shall consist of not fewer than 36 upper-division units. All courses applied toward the major and preparation for the major must be taken for a letter grade unless otherwise approved by the department chair. A 2.00 GPA in upper-division courses in the major is required for graduation. Once enrolled on this campus, students must complete all courses designated for a major in regular or summer sessions at UCR; exceptions to this policy must be approved by the department chair and by the associate dean.

Candidates for the B.A. degree may not receive more than 80 units of credit toward the degree for work taken in the major discipline (i.e., students must take at least 100 units outside the major discipline). Music and Dance majors may count a maximum of 102 units of music course work toward the B.A. degree (i.e., students must take at least 78 units outside the Music or Dance major).

Candidates for the B.S. degree may not receive more than 108 units of credit toward the degree for work taken in the major discipline (i.e., students must take at least 72 units outside the major discipline).

To receive the bachelor's degree, transfer students must complete a minimum of 16 upper-division units in the major on the Riverside campus.

Students who have been away from the university for several terms should consult with their major departmental advisor about the requirements under which they may graduate. See the Catalog Rights Policy for Undergraduate Degrees in the Policies and Regulations section of this catalog.

## College Policies and Procedures

For more information on UCR policies and regulations see the Policies and Regulations section of this catalog.

## College Regulations

Refer to the Student Academic Affairs Web site at [chassstudentaffairs.ucr.edu](http://chassstudentaffairs.ucr.edu) for more information on college policies and procedures.

## Student Responsibility

Students are responsible for meeting deadline dates regarding enrollment, add/drop/withdrawal, change of grading basis, credit by examination, declaration of candidacy, and other actions. The dates are online at [classes.ucr.edu](http://classes.ucr.edu) and must be observed. Advising can be obtained in the student's major department or in the college's Student Academic Affairs Office, 3400 Humanities and Social Sciences Building.

## Academic Advising

It is the student's responsibility to meet all graduation requirements: general university, college, and major.

Students with declared majors receive academic advising through their major department. Major advisors are available within each department or program (see a list of departmental staff for academic affairs at [chassstudentaffairs.ucr.edu](http://chassstudentaffairs.ucr.edu)). All departments assign an academic advisor to each major and may require an advisor's approval before enrolling, submitting an academic petition, or making a change in the class schedule. Entering students who have not yet selected a major field of study should contact the Student Academic Affairs Office.

Undeclared and Pre-Business students are advised through the Student Academic Affairs Office. A staff of academic advisors is readily available to assist with questions pertaining to academic regulations and procedures, selection of courses which satisfy breadth requirements, major options, and alternatives. Students who need to confer with an advisor about overall degree requirements, academic difficulty, program planning, or assistance in selecting a major need to schedule an appointment with their advisor.

## Course Enrollment

Students are required to register and enroll by the date set by the campus (visit [classes.ucr.edu](http://classes.ucr.edu) for details).

The recommended study load for undergraduate students is 15 to 16 units per quarter. This is the average quarterly load to ensure steady progress for graduation in four years. The minimal program for an undergraduate student to be considered full time is three courses (12 units) per quarter. The normal progress for an undergraduate student is four courses (16 units) per quarter.

A class schedule of fewer than 12 units must be approved by the associate dean (visit [classes.ucr.edu](http://classes.ucr.edu) for details). The college has established enrollment limits beyond which students require academic advisor approval. The limits are as follows: students in good academic standing, 20 units; students on academic probation, 17 units; students on subject-to-dismissal status, 15 units. Students on probation may not take courses on an "S/NC" basis.

After the second week of instruction, students may request changes by petition during a specified period. Petitions must usually be approved by the advisor and also, in the case of adds, by the instructor concerned. Changes to grading basis need advisor approval after the second week of classes. The associate dean must approve any changes in the class schedule requested after the regular petition period.

Courses (including Special Studies courses) can be added through the third week of instruction. Courses dropped after the second week of instruction will appear on the record with a "W" notation, signifying withdrawal. Students can withdraw from courses through the sixth week of instruction. The grading basis for a course can be changed through the eighth week of instruction. After the third week of instruction, a fee is required to file the petition to change the class schedule.

## Enrollment on Satisfactory/No Credit Basis

Undergraduate students in good academic standing may receive credit for courses undertaken and graded "S" up to a limit of one-third of the total units undertaken and passed on the Riverside campus at the time the degree is awarded. Normally, this means no more than 4 units of "S/NC" per quarter. The total also includes courses graded only "S/NC." Courses that are required in, or prerequisite to, a major may not be taken on a "S/NC" basis unless approved by the chair of the major department. Students on special status or limited status may take courses on a "S/NC" basis only with the approval of the associate dean.

A student may elect "S/NC" or delete "S/NC" from a course by filing a petition (enrollment adjustment form) with the Registrar. The deadline is the end of the eighth week of instruction and is listed each quarter at [classes.ucr.edu](http://classes.ucr.edu). This deadline is strictly enforced.

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.

## Repetition of Courses

See Repetition of Courses in the Policies and Regulations section.

## Part-time Study

For details, see Part-Time Study under the Finances and Registration.

## Petitions

A petition is a form representing a student's need or desire to be excepted from any standard rule or regulation in the university. It is the only way to obtain formal approval from the department, the college or school, the Registrar, or whomever has authority over a particular request. Some petitions carry a small fee; others are free.

An approved petition for a waiver or substitution in degree requirements represents an agreement between the student, the college or school, and in some cases, the department chair, granting the student an exception from the existing regulations.

Petitions are also used at UCR to change college or major, enroll in fewer units than regulations permit, make late changes to a class schedule, obtain credit by examination, concurrent enrollment, or withdraw from the university. Petitions for most of these exceptions are available in the Student Academic Affairs Office. Please note that petitions for retroactive actions more than one year old will not be approved.

## Credit by Examination

To earn credit for a course by examination without formal enrollment in that course, students must be in residence and in good academic standing.

Before the examination may be given, arrangements and approval for examination for degree credit must be made with the instructor appointed to give the examination, a faculty advisor (if the major department requires it), and the associate dean. Petitions must be filed with the Office of the Registrar no later than the third week of instruction. Credit by examination is not allowed for English Composition courses.

The results of all examinations for degree credit are entered on students' records as though they had actually taken the courses of instruction. There is a \$5 service charge for each petition. The credit by examination procedure may not be used as a means of improving a previous grade.

## Undergraduate Credit for Graduate Courses

Students who have a GPA of at least 3.00 in all courses taken in the university or have shown exceptional ability in a special field may take a graduate course for undergraduate credit with the permission of the instructor concerned. Students must have completed at least 18 upper-division quarter units basic to the subject matter of the course.

## Expected Progress for Undergraduate Students

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. Lack of adequate progress may jeopardize continued registration. Students can access their advisory degree check on Growl (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)).

## Applying for Graduation

To graduate from UCR, undergraduate students must file an application for graduation as specified by their college. The online Application for Graduation is available at the CHASS Student Academic Affairs Web site, at [chassstudentaffairs.ucr.edu](http://chassstudentaffairs.ucr.edu) and must be submitted by 4 p.m. of the deadline date listed at [classes.ucr.edu](http://classes.ucr.edu). Applications are not accepted after the deadline established for the quarter.

Students should review their remaining requirements on Growl (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)) each quarter. They should also contact their academic advisor in their major department or program two quarters before expected graduation to confirm remaining requirements. Completion of the degree depends upon completion of any work in progress. During the graduation quarter, any changes made to a student's schedule after the third week of instruction should be immediately reported to the academic advisor.

If for any reason a student does not meet the requirements for graduation after filing the application, another application must be filed for the appropriate quarter. Students graduating *in absentia* after an absence of one or more quarters must apply for readmission to the university and file an application for graduation.

All course work, whether taken at UCR or elsewhere, must be completed by the last day of UCR's finals week during the quarter of graduation (no GDs or Incomplete grades). Incomplete, IE, IP or GD grades on the transcript will stop the processing of the degree.

Once the application for graduation is filed, the student's name will be entered on the appropriate degree list. Students who need to amend the prospective quarter of graduation and who have submitted an application for graduation petition must notify the Student Academic Affairs Office, in writing, as soon as possible.

## Withdrawals

Students may withdraw from the university prior to the end of instruction, for serious personal reasons, with the approval of the associate dean. Students can initiate the withdrawal process online by going to [myforms.ucr.edu](http://myforms.ucr.edu).

## Preparing for the Professions

The wide variety of majors and programs available in the College of Humanities, Arts, and Social Sciences provides an excellent background and preparation for immediate entry into the job market or for graduate and professional schools. Some of these are listed below; however, students are urged to see their faculty advisor or a counselor in the Career Center for further information.

**The Arts** Undergraduate majors in the arts at UCR are designed to provide a solid liberal arts education at the same time as they provide essential training in the practical techniques of the specific art field involved. This means that arts majors provide a broad educational background, on a par with the other majors in the college, which prepares each student for effective participation in any job market where educational breadth is important.

Through the thorough practical training in each art field, an increasing number of UCR students are finding attractive career opportunities in the visual arts, writing, dance, music, and theater arts. Not that it has become any easier to practice as an artist or performer; these remain options best followed by the most talented and determined. However, the opportunities in many arts-related fields are increasing as the role of the arts continues to expand. Such opportunities include positions in teaching, music and dance therapy, graphics, theater management, costume design, performing arts management, fine arts publication, the recording industry, the arts, and criticism. Moreover, new professions, which will open yet wider vistas in coming years, are evolving for those trained in the arts.

UCR students who graduate with a major in one of the arts have consistently gained admission to graduate schools at outstanding universities, conservatories, and professional schools throughout the country.

At UCR, students may major in Art, Art History, Creative Writing, Dance, Media and Cultural Studies, Music, or Theatre. At the graduate level, the M.A. degree is offered in Art History and in Music. M.F.A. degrees include Experimental Choreography, Visual Art, and Creative Writing and Writing for the Performing Arts. A Ph.D. is offered in Critical Dance Studies.

The Chancellor provides performance awards for excellence in the arts for students who have already achieved high proficiency upon entry into the university and who will continue to practice their art forms while students at UCR. For further information, contact the departments of Art, Dance, Music, Theatre, and Creative Writing.

The Gluck Fellows Program of the Arts at UCR provides Gluck Faculty, Graduate, and Undergraduate Fellows the opportunity to bring their respective art forms to elementary, middle, and high school students and nursing home residents who have little or no access to the arts. The departments of Art, Art History, Creative Writing, Dance, Music, and Theatre as well as the Sweeney Art Gallery and UCR/California Museum of Photography participate in the Gluck Fellows Program of the Arts. Students interested in the Gluck Fellows Program of the Arts should check with individual departments.

**Business** While no specific major is required for admission to most graduate schools of administration or management, the undergraduate programs in Business Economics and the various majors offered in combination with Administrative Studies provide excellent preparation. At UCR, the curriculum in these majors stresses the principles of managerial decision making and methods of gathering and analyzing the diverse data on which decisions must be based.

It is also important to note that other majors in the liberal arts can serve as effective preparation for entry into the worlds of management and business. Any major curriculum that includes substantial emphasis on oral and written expression and analytic and critical thinking can serve this purpose, particularly if accompanied by a suitable cluster of courses in business and management topics. Internships, which are available in business and industry settings, can assist in clarifying educational and personal goals, allowing exploration of alternative career options, and providing the opportunity to apply academic background to a practical, real world experience.

Students who wish to pursue a graduate degree in the Business Administration field may wish to consider UCR's School of Business Administration.

**Law** Most law schools require a baccalaureate degree. Law schools do

not require a uniform prelaw course of study or a specific college major; backgrounds in the physical sciences are as acceptable as those in the social sciences and humanities. However, law schools in general do recommend that the prelaw student attempt to reach several goals during the undergraduate years: an understanding of the development of social, political, and economic institutions; an ability to communicate well, both orally and in writing; the capacity to think clearly, carefully, and independently; and a habit of disciplined study. Therefore, there is no specific, formal prelaw curriculum that a student must take.

Most law schools require applicants to take the Law School Admission Test, administered regionally by the Educational Testing Service. The test is administered at UCR on three occasions during the year. Applications for and information about this test may be obtained in the Department of Political Science.

Students who are considering applying to law schools are strongly urged to consult with the prelaw advisor in the Department of Political Science, 2224 Watkins Hall.

**Librarianships** All library schools accredited by the American Library Association require a baccalaureate degree for admission and usually a reading knowledge of one or two languages other than English. A broad general background, supported by the ability to read rapidly and intelligently, is helpful. The knowledge, in depth, of the literature of some subject area is especially advantageous. All subject fields, including the biological and natural sciences, the humanities, and the social sciences may prepare a student for graduate study in librarianship.

In addition to career opportunities in public, school, and academic libraries, special librarians may work in government agencies, and in commercial and industrial firms, such as pharmaceutical companies, banks, and advertising agencies.

**Museums, Archives, and Historic Preservation** The American Association of Museums and The Society of American Archivists have designated the master's degree as the professional degree level for careers in museums and archives. The Public History Program M.A. (Department of History) provides professional education and training for these careers, as well as for careers in general historic preservation and public history.

The UCR/California Museum of Photography is of significant value to those interested in photographic history and museum practices, as well as to those with creative interests in photography.

**Public Administration** Government agencies offer many administrative career options including jobs in personnel, budget administration, labor relations, program analysis and public information. These types of positions may require a bachelor's or a master's degree or a combination of degrees plus experience. Students interested in a career in public information are encouraged to acquire a broad liberal arts education at the undergraduate level. An undergraduate major in any of the social sciences provides appropriate preparation for graduate work in public administration. Special attention is called to the majors in Political Science/Administrative Studies, Political Science/International Affairs, and Political Science/Public Service.

At UCR, students may gain valuable experience in government agencies through the Academic Internship Program. In addition to numerous local internship settings, there are quarter-away internships available in several Sacramento and Washington, D.C. offices. See the Career Center in the Services for Students section of this catalog.

**UC Center at Sacramento** offers student internship opportunities. Students live in UC housing, near the state Capitol, and intern from 24 to 33 hours per week with members of the state legislature, government offices, or nonprofit agencies. See UC Center at Sacramento in the Introducing UC Riverside section of this catalog.

The **UCR Washington Academic Program** provides undergraduate students with a multidimensional educational experience in Washington, D.C. Students undertake academic pursuits as well as cultural and social activities. The program combines course work with field research and internship experience. See UCR Washington Academic Program in the Introducing UC Riverside section of this catalog.

**Social Welfare** Full professional training usually consists of two years of graduate training leading to the degree of Master of Social Work.

Students planning to seek employment in social welfare after completing the baccalaureate degree should prepare in the fields of psychology (particularly child and adolescent psychology and the study of personality), sociology (with emphasis on society and personality, social thought and social organization), economics, political science, anthropology, and statistical and research methods in the social sciences. Students who plan to enter a professional school of social work following undergraduate training should consult with an advisor at UCR for the best selection of classes.

Career opportunities for students with the B.A. or B.S. degree include positions as deputy probation officer, social worker, group counselor, corrections officer, substance abuse counselor, and community relations worker. Internships provide useful experience as part of the undergraduate program in preparation for such careers.

**Teaching Credential Programs** Students planning a career as a teacher may wish to consider one of the majors that offers a subject-matter preparation program.

Specific details and counseling are available at individual department offices and the Graduate School of Education and at [education.ucr.edu](http://education.ucr.edu).

Students who are considering working toward any teaching credential should attend one of the credential information seminars offered by the Teacher Education Services Office (1124 Sproul) for advice in planning an academic program.

# College of Natural and Agricultural Sciences

CNAS Undergraduate Academic Advising Center  
1223 Pierce Hall  
University of California, Riverside  
Riverside, CA 92521  
(951) 827-7294; fax (951) 827-2243  
[cnasstudent.ucr.edu](http://cnasstudent.ucr.edu)

With strengths in the biological, physical, mathematical, and agricultural sciences, the college offers the Bachelor of Arts and the Bachelor of Science degrees. The B.A. degree, when offered, provides for both broad general education and major field specialization. The B.S. degree stresses advanced work in the major and associated fields. All degree programs provide students with an opportunity to develop an understanding and appreciation of our relationship to the world around us, in addition to preparing them for careers in their fields of specialization.

The variety of degree programs and the flexibility of each provide great freedom of choice to students. Cooperative efforts between departments in the college provide for interdepartmental (interdisciplinary) majors. Students may elect to take double majors within the college or between this college and another. See the college's Undergraduate Academic Advising Center for information on double majors. Individual majors may be planned for students who find that individual goals can be accommodated through the resources and interested faculty at UCR. Information and regulations on individual majors may be obtained from the college's Undergraduate Academic Advising Center.

For information on graduate degrees see the Graduate Studies section of this catalog.

## Majors

A major is a coordinated group of upper-division courses (100-199 series) in a field of specialization. Early choice of a major is desirable. Students must declare a major by the time they have earned 90 units. The courses for any particular major are specified by the relevant department or departmental group, and they must provide at least 36 upper-division units of credit, normally taken on a letter grade basis. No more than 84 units in any one discipline may be applied to the degree.

## Admission to Majors

**Admission of Freshmen** Applicants to majors in the College of Natural and Agricultural Sciences who excel in the academic criteria, with additional emphasis on advanced mathematics and laboratory science preparation, will be considered. It is strongly recommended that students have sufficient mathematics competency to qualify for college-level calculus at the time of enrollment.

**Mathematics Advisory Examination** All incoming CNAS freshmen who are not exempt must take the Mathematics Advisory Examination (MAE) prior to attending the summer Highlander Orientation. Certain MAE scores that indicate the need for additional work in intermediate algebra will place students in a college-level intermediate algebra course. This means that these students will need to complete an intermediate algebra course prior to enrolling in any Science and Math courses required for CNAS majors. Students will have the option to enroll in the Intermediate Algebra Workshop college-level intermediate algebra course during the summer prior to their first Fall quarter at UC Riverside or, at the latest, during their first Fall quarter. Students who fail to complete the IAW college-level intermediate algebra course with a grade of "C" or better will not be able to continue as CNAS students in the Fall quarter for those who take the course in the summer or the Winter quarter for those taking the course in the Fall quarter of their freshman year.

Students may complete the IAW college-level intermediate algebra course at any community college during the Summer or may complete the appropriate course taught on the UCR campus in the Fall. For more information about the IAW program, students may visit [learningcenter.ucr.edu/Incr35](http://learningcenter.ucr.edu/Incr35).

## College of Natural and Agricultural Sciences Undergraduate Majors and Options

Department/Program	Degree	
Biochemistry		
Biology emphasis	B.A.	B.S.
Chemistry emphasis	B.A.	B.S.
Medical Sciences emphasis	B.A.	B.S.
Biological Sciences <sup>1</sup>		B.S.
Bioinformatics and Genomics track		B.S.
Biology track		B.S.
Cell, Molecular, and Developmental Biology track		B.S.
Conservation Biology track		B.S.
Environmental Toxicology track		B.S.
Evolution and Ecology track		B.S.
Medical Biology track		B.S.
Microbiology track		B.S.
Plant Biology track		B.S.
Biology	B.A.	B.S.
Cell, Molecular, and Developmental Biology	B.A.	B.S.
Chemistry	B.A.	B.S.
Chemical Physics option		B.S.
Environmental Chemistry option		B.S.
Earth Sciences		
Geology		
General Geology option		B.S.
Geobiology option		B.S.
Geophysics option		B.S.
Global Climate Change option		B.S.
Geophysics		B.S.
Geoscience Education	B.A.	
Entomology	B.A.	B.S.
Environmental Sciences		
Environmental Toxicology option	B.A.	B.S.
Natural Science option	B.A.	B.S.
Social Science option	B.A.	B.S.
Environmental Sciences (joint with California State University, Fresno) <sup>1</sup>		B.S.
Mathematics		
Pure Mathematics	B.A.	B.S.
Applied Mathematics		
Biology option	B.A.	B.S.
Chemistry option	B.A.	B.S.
Economics option	B.A.	B.S.
Environmental Sciences option	B.A.	B.S.
Physics option	B.A.	B.S.
Statistics option	B.A.	B.S.
Computational Mathematics	B.A.	B.S.
Mathematics for Secondary School Teachers		B.S.
Microbiology	B.A.	B.S.
Neuroscience	B.A.	B.S.
Physics	B.A.	B.S.
Applied Physics and Engineering		B.S.
Biophysics option		B.S.
Physics Education		B.S.
Plant Biology	B.A.	B.S.
Statistics	B.A.	B.S.
Statistical Computing option		B.S.
Quantitative Management option		B.S.

### Disciplinary Minors

Applied Statistics	Global Climate Change
Chemistry	Mathematics
Entomology	Neuroscience
Environmental Sciences	Physics
Geology	Plant Biology

<sup>1</sup> New student registration in this program is not open at present.

For more information about offerings of intermediate algebra courses at other California community colleges, students may visit [placementtest.ucr.edu/mae/ccolist.html](http://placementtest.ucr.edu/mae/ccolist.html).

Students who place in but do not plan to complete a IAW college-level intermediate algebra course by the end of their first quarter of enrollment at UC Riverside, should file a Change of Major Petition to an appropriate, non-Calculus-requiring major in the College of Humanities, Arts, and Social Sciences (CHASS) or petition the CNAS Associate Dean of Student Academic Affairs to remain in CNAS under special circumstances. Students who pass the IAW college-level intermediate algebra course with a "C" or better will be advised to enroll in Math 8A for the following quarter at UC Riverside.

**Transfer Students** The College of Natural and Agricultural Sciences emphasizes additional math and science preparation in its selection of students. Applicants must have a GPA of 2.70 or better in transferable course work. Applicants to majors in Biochemistry; Biology; Cell, Molecular, and Developmental Biology; Chemistry; Microbiology; and Physics must complete one-year sequences in three areas of science and/or mathematics. Applicants to the Plant Biology major must complete one-year sequences in two areas of science, with an additional one-year sequence of mathematics highly recommended but not mandatory. The same preparation is recommended for applicants to other majors. For more information regarding these criteria, students may visit [assist.org](http://assist.org).

The Intersegmental General Education Transfer Curriculum (IGETC) is not accepted for students planning to transfer to the College of Natural and Agricultural Sciences. Although courses taken to satisfy the IGETC may be applied to the college's breadth pattern, students should concentrate on completing transferable mathematics and science courses.

## Choosing a Major, Undeclared Majors

Although freshmen may choose an academic major on entering UCR, those who are unsure about specific academic goals may request to be admitted to the college as an undeclared student, choosing one of three options in this category.

1. Undeclared — Life Sciences, for students interested in Biochemistry; Biology; Cell, Molecular and Developmental Biology; Entomology; Microbiology; Neuroscience; or Plant Biology.
2. Undeclared — Mathematic Sciences, for students interested in Mathematics or Statistics
3. Undeclared — Physical Sciences, for students interested in Chemistry, Earth Sciences, Environmental Sciences, or Physics

Students who follow the recommended program for any of the three undeclared options will be prepared to enter a wide variety of science majors. Even if their plans change several quarters later, they will have avoided academic difficulty by planning a sensible, basic preliminary strategy. Individuals entering as students in one of the three undeclared options are advised through the college's Undergraduate Academic Advising Center by both professional academic advisors and faculty mentors from diverse science departments. Actual admission into degree programs is predicated upon successful completion of courses with satisfactory grades. Transfer into another college requires performance judged to be satisfactory by that college.

All students with 90 or more units toward a degree are expected to declare a major. To declare a major, obtain approval from the college's Undergraduate Academic Advising Center by filing a Change of Major Petition. Students are expected to declare a major by the beginning of their junior year (completion of 90 units). Students who fail to declare a major by this time will not be permitted to register until an approved declaration of major has been submitted to the Associate Dean at the CNAS Undergraduate Academic Advising Center.

If students in one of the three undeclared options feel their interests lie primarily in the areas of humanities or social sciences, advising can be obtained in the College of Humanities, Arts, and Social Sciences, (951) 827-3683. Students interested in engineering or computer science can be advised in the Bourns College of Engineering, (951) 827-ENGR (3647).

## Double Majors

A declaration of a second major must be filed at the college's Undergraduate Academic Advising Center at least two quarters before graduation and approved by both academic major advisors and the associate dean. At the time of filing, a student must have completed 120 units, with at least 18 upper-division units in the primary major and at least 8 upper-division units in the secondary major. Of the required upper-division units, a minimum of 24 (no more than 4 of which can be 190-199 courses) must be unique to each major. To declare a second major, a student must have a cumulative GPA of 2.7 or higher and a major GPA of 2.7 or higher. A student may elect a second major in a department or interdepartmental group of another college. A declaration of such a second major must be signed by the associate deans of both colleges and filed by the student with the primary college. A student must meet requirements of both primary and secondary majors and the college requirements of the primary major if they are both in the same baccalaureate class. If the two majors lead to different degrees (B.S. and B.A.), that fact is noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements for both majors must be met. Information on how to file for double majors may be obtained from the college's Undergraduate Academic Advising Center.

## Changing Majors

Students may change majors if they are in good standing and not expected to exceed the unit limitation of 216 units toward the degree. Students can petition to change their major within the college or transfer from another college to the College of Natural and Agricultural Sciences. Students interested in transferring to the College of Natural and Agricultural Sciences should consult with an advisor in the CNAS Undergraduate Academic Advising Center regarding specific prerequisite courses. Students will be reviewed for course coverage and GPA for the new major.

Students who fail to attain a GPA of 2.00 ("C") in preparation for the major or major courses may be denied the privilege of entering or continuing in that major.

## Minors

Each minor in the College of Natural and Agricultural Sciences consists of not fewer than 20 nor more than 28 units of organized upper-division courses. No more than 4 units of 190-199 courses may be used in fulfilling the upper-division unit requirement for a minor. Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements. The CNAS Undergraduate Academic Advising Center is responsible for student and administrative issues pertaining to the minors offered by CNAS. Minors offered by other colleges are administered by the department, program, or interdisciplinary program offering the minor. Students must file a declaration of a minor by filing a petition with the college's Undergraduate Academic Advising Center at least two quarters before graduation and must be in good academic standing at the time of filing. A minor requires the signature of the Academic Advisor that supervises the minor and the signature of the associate dean.

## University Honors Program

For a description of the University Honors Program, see Educational Opportunities in the section Introducing UC Riverside. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section.

## Financial Assistance

The College of Natural and Agricultural Sciences maintains funds for undergraduate scholarships. Application materials and information are available in the college's Undergraduate Academic Advising Center during spring quarter. Visit [cnasstudent.ucr.edu](http://cnasstudent.ucr.edu) or e-mail [cnasstudent@ucr.edu](mailto:cnasstudent@ucr.edu).

## Freshman Advising Seminars

Freshman Advising Seminars are designed to introduce students to a wide variety of topics in the College of Natural and Agricultural Sciences, including major selection, curriculum planning, career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education and an introduction to the faculty in the college. Each quarter's offerings are listed at [classes.ucr.edu](http://classes.ucr.edu) under NASC 091 and NASC 093. Topics vary from quarter to quarter.

The seminars have no prerequisites, and freshmen are given enrollment priority. Each seminar is limited to 24 students to encourage discussion and carries 1 or 2 units of academic credit, although units are not applied toward major requirements. The seminars are graded on an "S/NC" basis.

## Degree Requirements

Students in the College of Natural and Agricultural Sciences must meet three levels of requirements for the B.A. or B.S. degree: general university requirements, college requirements, and major requirements.

## General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section. For information on university regulations see the Policies and Regulations section of this catalog.

In addition to the above general university requirements, the College of Natural and Agricultural Sciences has the following unit requirement.

## Unit Requirement

Students are not normally expected to take significantly more than 180 units to obtain the bachelor's degree. After earning credit for 216 units, a student will not be permitted to continue except by approval of the associate dean when specific academic or professional reasons are involved.

The following credit limitations apply for all students enrolled in the college:

1. After completing 105 quarter units at a community college, students are not allowed further units for courses completed at a community college.
2. No more than 6 units in physical education activity courses may be applied toward the bachelor's degree.
3. No more than three courses in the 300 series of courses may be applied toward the bachelor's degree. Credit is not granted for 400 series courses taken in UC Extension.

## College Policy for the Intersegmental General Education Transfer Curriculum

The Intersegmental General Education Transfer Curriculum is not accepted for students planning to transfer to the College of Natural and Agricultural Sciences. It does not adequately cover the lower-division mathematics and science prerequisites required for majors in this college.

## College Breadth Requirements

For the following requirements, a course is defined as a block of instruction that carries credit of 4 or more units. Courses taken in the department or program of a student's major (including courses cross-listed with the major) may not be applied toward the breadth requirements except for Biology majors and Biological Sciences majors in connection with the Biological Sciences requirement. However, courses outside the major discipline, but required for the major, may be applied toward satisfaction of these requirements.

Some majors in the college may have specific course requirements for meeting the following breadth requirements. Check under individual major requirements in the Programs and Courses section of this catalog.

Requirements are for both the B.A. and the B.S. degrees unless specified separately.

## College of Natural and Agricultural Sciences Breadth Requirement Unit Summary

### For the B.A.

English Composition	Varies
Humanities	20
Social Sciences	16
Ethnicity (4 units) <sup>1</sup>	—
Foreign Language	16
Natural Sciences and Mathematics	20
Total Units	72 plus English Composition

### For the B.S.

English Composition	Varies
Humanities	12
Social Sciences	12
Ethnicity (4 units) <sup>1</sup>	—
Natural Sciences and Mathematics	20
Additional Courses	16
Total Units	68 plus English Composition

<sup>1</sup>The 4-unit ethnicity requirement can be applied to either the Humanities or Social Sciences requirement, depending on content.

## Humanities

**For the B.A. degree:** 20 units

1. One course in World History (At UCR, courses that satisfy this requirement are HIST 010, HIST 015, or HIST 020.)
2. One course in the fine arts (Art; Art History; Creative Writing courses in poetry, fiction, or playwriting; Dance; Media and Cultural Studies; Music; Theatre or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences)
3. Two courses from among the following:
  - a) Literature taken in the departments or programs in Comparative Literature and Foreign Languages, English, Media and Cultural Studies, Hispanic Studies, or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences.
  - b) Philosophy, taken in the Department of Philosophy, or from among courses within this discipline as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
  - c) Religious Studies, taken in the Department of Religious Studies, or from among courses within this discipline as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
4. One additional course from the following:
  - a) History, the Fine Arts, Literature, Philosophy, Religious Studies
  - b) A foreign language at level 4 or above
  - c) A humanities course offered by Ethnic Studies; Comparative Ancient Civilizations; Creative Writing (courses in journalism); Humanities, Arts, and Social Sciences; Latin American Studies; Linguistics; Media and Cultural Studies; or Women's Studies

No course used to satisfy the English Composition requirement will apply toward Humanities credit.

No more than two courses in performance may be counted toward the Humanities requirement.

## English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college-level instruction in English Composition with no grade lower than “C.” UCR’s sequence is ENGL 001A, ENGL 001B, and ENGL 001C. ENGL 01HC or ENGL 01SC may be substituted for ENGL 001C, but only one of these courses can be taken for credit. Transfer students who have credit for one semester of English Composition from another institution must take two additional quarters (i.e., ENGL 001B and ENGL 001C).

Students can use a score of 3 on the College Board Advanced Placement Test in English to satisfy ENGL 001A; they must complete ENGL 001B and ENGL 001C. Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied ENGL 001A and ENGL 001B; they must complete ENGL 001C.

Beginning with their initial matriculation, students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and ENGL 001A, ENGL 001B, and ENGL 001C is completed with satisfactory GPA. A student may not receive baccalaureate credit for any work in English composition taken prior to completing the Entry Level Writing Requirement.

### For the B.S. degree: 12 units

1. One course in world history (At UCR, courses that satisfy this requirement are HIST 010, HIST 015, or HIST 020.)
2. One course from among the following:
  - a) Fine arts (Art; Art History; Creative Writing courses in poetry, fiction, or playwriting; Dance; Media and Cultural Studies; Music; Theatre or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences)
  - b) Literature taken in the departments or programs in Comparative Literature and Foreign Languages, English, Hispanic Studies, Media and Cultural Studies or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
  - c) Philosophy, taken in the Department of Philosophy, or from among courses within this discipline as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
  - d) Religious Studies, taken in the Department of Religious Studies, or from among courses within this discipline as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
3. One additional course chosen from the following:
  - a) History, the Fine Arts, Literature, Philosophy, Religious Studies
  - b) A foreign language at level 3 or above
  - c) Humanities courses offered by Ethnic Studies; Comparative Ancient Civilizations; Creative Writing (courses in journalism); Humanities, Arts, and Social Sciences; Latin American Studies; Linguistics; Media and Cultural Studies; or Women’s Studies

No course used to satisfy the English Composition requirement will apply toward Humanities credit.

No more than one course in performance may be counted toward the Humanities requirement.

## Social Sciences

### For the B.A. degree: 16 units

1. One course must be taken in the departments of Economics or Political Science or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
2. One course must be taken in the departments of Anthropology, Psychology, or Sociology, or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and

Social Sciences

3. Social science courses offered by Ethnic Studies; Environmental Sciences; Geography (cultural geography courses); Human Development; Humanities, Arts, and Social Sciences; Women’s Studies, or one of the disciplines in 1. or 2. above

### For the B.S. degree: 12 units

1. One course must be taken in the departments of Economics or Political Science or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
2. One course must be taken in the departments of Anthropology, Psychology, or Sociology, or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
3. Social science courses offered by Ethnic Studies; Environmental Sciences; Geography (cultural geography courses); Human Development; Humanities, Arts, and Social Sciences; Women’s Studies; or one of the disciplines in 1. or 2. above

Course work that may be taken to be used in partial satisfaction of the Humanities and the Social Sciences requirements must be evaluated by the college’s Undergraduate Academic Advising Center. The college’s Undergraduate Academic Advising Center, in consultation with the college Executive Committee, determines which courses apply to these requirements. It will implement this policy.

It is the student’s responsibility to verify those courses that fulfill either the Humanities or the Social Sciences requirement, particularly the series of courses in cultural geography.

## Ethnicity: 4 units

One course dealing with general concepts and issues in the study of race and ethnicity in California and the United States. Courses that satisfy this requirement must concentrate on one or more of four principal minority groups (African American, Asian American, Chicano/Latino, and Native American). These courses must be comparative in nature, analyzing the minority group experience within the present and historical context of other racial and ethnic groups, such as European-American minorities. The courses are to be offered by or cross-listed with the Department of Ethnic Studies.

Regardless of the student’s college and major, the course may be counted toward the Humanities or the Social Sciences graduation requirements, depending upon the course’s content as evaluated by the College of Humanities, Arts, and Social Sciences Executive Committee. Check with the college’s Undergraduate Academic Advising Center for the courses that fulfill the Ethnicity requirement.

## Foreign Language

### For the B.A. degree: 16 units

This requirement may be fulfilled in one language by completing course 4 with a minimum grade of “C” or demonstrating equivalent proficiency; or by completing course 2 with a minimum grade of “C” in each of the two languages; or by demonstrating equivalent proficiency (level 2) in each of two languages. American Sign Language may also be used to satisfy this requirement. Biology and Neuroscience majors must complete four quarters of one language. Students who are pursuing a B.A. degree and who have not completed a foreign language course may enroll in a level-1 foreign language course. However, students must take a placement exam if they plan to take a course in the same foreign language that they studied in high school. The placement exam may be taken only once in each subject during a student’s UCR career. Transfer students who have taken a college-level foreign language course should consult with an advisor.

## Natural Sciences and Mathematics: 20 units

1. One course in Mathematics, Statistics, or Computer Science
2. One course in Biological Sciences (Biochemistry, Biology, Entomology, Nematology, Plant Biology, or Plant Pathology); the course must include a laboratory

3. One course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural geography courses)
4. Two additional courses from areas (2) or (3) above or in physical and/or biological science courses offered in the Department of Environmental Sciences

This requirement may automatically be satisfied by lower-division requirements for the major.

### **Additional Courses: 16 units**

**For the B.S. degree:** An additional 16 units of substantive course work in the student's chosen major or fields related to the major is required. The additional course work is specified by the major department.

## **Major Requirements**

Detailed requirements for each major are found under the department listings in the Programs and Courses section of this catalog.

A major in the College of Natural and Agricultural Sciences shall consist of not fewer than 36 nor more than 60 upper-division units. No more than 9 units of courses in the 190-199 series may be counted in fulfilling the upper-division units needed for the major.

By the beginning of the junior year, students must consult with their advisor and choose a major. A GPA of at least 2.00 (C) in the upper-division courses taken in the major field is required for graduation.

## **Life Sciences Core Curriculum**

A lower-division core curriculum prepares students for a wide variety of majors, including Biochemistry; Biological Sciences, Biology; Cell, Molecular, and Developmental Biology; Entomology; Microbiology; Neuroscience; and Plant Biology. Students complete a uniform core curriculum prior to advancing to upper-division courses. The curriculum is Introductory Biology (1 year, including laboratory), General Chemistry including laboratory (1 year), Organic Chemistry (1 year), Calculus (2 quarters), Physics including laboratory (1 year), Statistics (1 quarter), and Introductory Biochemistry (1 quarter). No more than 12 units of upper-division life sciences courses not being used to satisfy the core may be taken prior to completion of the core.

## **College Policies and Procedures**

For detailed information on UCR policies and regulations see the Policies and Regulations section of this catalog.

## **College Regulations**

Detailed information and specifics with regard to the college regulations governing undergraduate student status as approved by the faculty and contained in the *Manual of the Riverside Division of the Academic Senate* may be obtained from a faculty advisor or the college's Undergraduate Academic Advising Center.

## **Student Responsibility**

Students are responsible for meeting deadline dates regarding enrollment, add/drop, change of grading basis, credit by examination, withdrawal, applications for graduation, declaration of candidacy, and other actions. The deadline dates are listed at [classes.ucr.edu](http://classes.ucr.edu) and must be observed. Academic advising can be obtained in the college's Undergraduate Academic Advising Center, 1223 Pierce Hall.

## **Faculty Mentors**

All students who declare a major upon entrance to the College of Natural and Agricultural Sciences are assigned to a department or interdepartmental faculty oversight committee granting the degree for that major or area of specialization. For assignment of faculty mentors, new students should report to the Undergraduate Academic Advising Center. Students in one of three undeclared options in the college are also advised in the college's Undergraduate Academic Advising Center.

## **Professional Academic Advisors**

Students should keep in touch with their professional academic advisor housed in the Undergraduate Academic Advising Center on all academic matters, including choice of courses, consideration of a major, and requirements for graduation. Before consulting the academic advisor, students should formulate a tentative program according to their interests and needs and should be familiar with general university, college, and major requirements.

It is important that each student keep in mind that the advisor serves to assist students but does not administer the student's program. Students must be responsible for ensuring that they meet all requirements for graduation.

## **Course Enrollment**

Before each quarter, students advance enroll in all courses they plan to take. Every student's course schedule must be approved by the student's academic advisor. Students are expected to register and enroll by the date set by the campus (visit [classes.ucr.edu](http://classes.ucr.edu) for details).

Since the college expects all students to make regular progress toward their degrees, class schedules of less than 12 units must be approved by the associate dean. Repeated courses are considered part of the total unit load.

Students on probation may not register for more than 15 units in a quarter without consent of the associate dean. No student may enroll in less than 8 units (two classes).

During the first two weeks of the quarter, students make course enrollment changes via the Growl registration system (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)), and approvals by academic advisors and instructors are generally not required. After the second week of instruction ends, students must file an enrollment adjustment form online at [myforms.ucr.edu](http://myforms.ucr.edu) to make changes. With the approval of their academic advisor and the course instructor, students may add courses to their class schedule up to noon on the end of the third week of classes. With the approval of their academic advisor, students may withdraw from a course up to the end of the sixth week or change the grading basis up to the end of the eighth week. For courses dropped after the second week, a "W" appears on the transcript, indicating withdrawal. Students may withdraw from all their courses up until the end of the tenth week of instruction. Students exercising this option will receive "W's" in all their courses for that quarter.

## **Enrollment on a Satisfactory/No Credit Basis**

Students in this college who are not on probation may take nonmajor courses on an "S/NC" basis and other courses graded only on an "S/NC" basis, provided they do not exceed one third of the total units undertaken and passed (graded "S") on the UCR campus at the time the degree is awarded.

Lower-division mathematics or science courses that are prerequisites to major courses cannot be taken on an "S/NC" basis.

A student may elect "S/NC" or delete "S/NC" from a course during the Growl enrollment period or later in the quarter by filing an enrollment adjustment form online at [myforms.ucr.edu](http://myforms.ucr.edu). The deadline is the end of the eighth week of instruction and is listed each quarter at [classes.ucr.edu](http://classes.ucr.edu).

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.

## **Credit by Examination**

A student may petition for the privilege of examination for degree credit without formal enrollment in a particular course but must be in residence and not on academic probation. Arrangements for examination for degree credit must be made with the student's faculty mentor. Approvals of the faculty mentor, the associate dean of the college, and the instructor who is agreeing to give the examination are necessary before the examination may be given. The results of all examinations for degree credit are entered on the student's record as though the student had actually taken the courses of instruction.

## **Undergraduate Credit for Graduate Courses**

Upper-division students with a UCR cumulative GPA of 3.00 or above may take a graduate course for undergraduate credit with the permission of the

faculty advisor and the instructor concerned. See the CNAS Undergraduate Advising Center for more information.

## Expected Progress for Undergraduate Students

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. UCR requires all undergraduate students to make Expected Progress each academic year. A full-time undergraduate student is considered to be making Expected Progress towards a baccalaureate degree if the student:

- Passes at least 45 units each academic year
- Declares a major by the time the student earns 90 units
- Follows a program of study consistent with the student's declared or undeclared major

Students who have not earned a minimum of 37 units each academic year, have not declared a major by the time they earn 90 units, or are not following a program of study consistent with the student's declared or undeclared major are not considered to be making Expected Progress towards a baccalaureate degree.

Students who fail to make Expected Progress may be ineligible for continued registration. Continued registration will be at the discretion of the associate dean.

Students can access their advisory degree check on Growl (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)).

## Declaration of Candidacy

If it is necessary to amend the prospective date of graduation during the quarter in which graduation is expected, the student must notify the college's Undergraduate Academic Advising Center, in writing, as soon as possible. Applications for graduation are available in the college's Undergraduate Academic Advising Center and must be filed in the office by the deadline established for the quarter in which graduation is expected. The deadline for filing applications for graduation is listed at [classes.ucr.edu](http://classes.ucr.edu) each quarter.

Applications are not accepted after the deadline established for the quarter in which the student intends to graduate. If for any reason the student does not meet the requirements for graduation after announcing candidacy, or fails to meet the deadline for filing, a new application must be filed for the subsequent quarter.

Students graduating *in absentia* after an absence of one or more quarters must apply for readmission to the university and file an Application for Graduation with the college Undergraduate Academic Advising Center.

## Preprofessional Academic Preparation

Undergraduate academic preparation for several professional careers can be acquired in the College of Natural and Agricultural Sciences. Brief explanations of preprofessional academic programs follow.

**Forestry** Freshmen at UCR who plan to transfer after their sophomore year to UC Berkeley's College of Natural Resources, forestry program, should enroll in UCR's Plant Biology major. Interested students should consult the UC Berkeley General Catalog and contact Berkeley's College of Natural Resources for advising. Assistance is also available from the College of Natural and Agricultural Science's Undergraduate Academic Advising Center.

**Medical Technology** Training for Clinical Laboratory Scientist Prospective licensed clinical laboratory scientists should obtain a bachelor's degree in either biochemistry, biology, or biological sciences. Students must apply independently to any of the state-approved programs in clinical laboratory science offered at various universities and hospitals. Following successful completion of this training and testing by the state of California the student is eligible to become a licensed clinical laboratory scientist. Prerequisites for entry change periodically, so interested students should obtain current information from the Medical and Health Careers Program at [mhcp.ucr.edu](http://mhcp.ucr.edu). The state Department of Health also provides information on careers in this field.

**Medicine and Dentistry** Although the specific requirements of all medical and dental schools cannot be listed here, the general requirements are discussed below to indicate the various preprofessional programs available at UCR.

More than 90 percent of the students admitted to medical schools in the United States have attained the B.A. or B.S. degree, and a large proportion of those admitted to dental schools have three or more years of undergraduate work.

Leaders in medical and dental education urge prospective students to arrange their programs to obtain a broad general education, since the subject matter of the humanities and social sciences is not offered by the professional schools. It is recommended that students preparing to seek admission to medical or dental school obtain a bachelor's degree, to which all of UCR's preprofessional programs lead.

A student may satisfy the requirements for admission to medical or dental school in one of the following ways:

1. Completing the Biology major
2. Completing the Biochemistry major with a Medical Sciences emphasis
3. Completing a Biological Sciences major with the Medical Biology track
4. Majoring in any department but fulfilling concurrently the specific course requirements of medical or dental schools
5. Completing the major in Chemistry

Most medical and dental schools recommend that the courses shown above be taken in a preprofessional degree program. These courses should include laboratories.

Course Work for Medicine and Dentistry	Years
General chemistry	1
Organic chemistry	1
Physics	1
General biology	1
Upper-division biochemistry	
Upper-division genetics	
Mathematics through integral calculus	
Statistics	
Psychology	

**UCR/UCLA Thomas Haider Program in Biomedical Sciences** Undergraduate students who entered UCR either as freshmen or transfer students may apply to the UCR/UCLA Thomas Haider Program in Biomedical Sciences. Students from any major can apply for one of the 24 seats reserved for UCR students. Refer to the UCR/UCLA Thomas Haider Program in Biomedical Sciences in the Programs and Courses section of this catalog.

**Other Health Professions** In addition to those described above, UCR offers the preprofessional requirements for entrance to other health professional schools, including optometry, pharmacy, podiatry, nursing, physical therapy, and physician assistant, among others. Information about these can be obtained from the Health Professions Advising Center (HPAC), [hpac.ucr.edu](http://hpac.ucr.edu), or the Career Center (Veitch Student Center).

**Teaching** The California Commission on Teacher Credentialing has established guidelines and standards that prepare students for teaching credentials. For a description of how students can prepare for the multiple-subject (elementary) and single subject (secondary) credentials, refer to individual departments in the Programs and Courses section of this catalog.

After earning the bachelor's degree, the prospective teacher registers for an additional year of training in education theory and practice needed to obtain a teaching credential. Anyone considering obtaining a teaching credential should attend one of the credential information seminars offered by the Teacher Education Services Office, 1124 Sproul Hall, and consult with an advisor early in the planning of an academic program.

**California Teach-Science/Mathematics Initiative (CaTEACH-SMI)** Students with a talent for science, math or engineering can translate that ability into preparing for a teaching career in California through the California Teach-Science/Mathematics Initiative (CaTEACH-SMI). Students who partner with CaTEACH-SMI at UCR can complete a science, engineering, or mathematics degree and become eligible for an intern teaching credential in just four years. Beginning with the freshman year, students intern in a local primary or secondary classroom with a mentor teacher. At UCR, they can meet other CaTEACH-SMI students and their UCR peer mentor at the program's Resource Center, where students can receive credential advising. The CaTEACH-SMI Resource Center also provides future STEM teachers with material and financial resources, such as the SMI & Alpha Center Apprentice Programs and the NSF Noyce Scholarship Program. For more information contact [smi@ucr.edu](mailto:smi@ucr.edu) or visit the Resource Center at 1315 Pierce Hall or [smi.ucr.edu](http://smi.ucr.edu).

The **Prepare to Teach Program** is a preprofessional program open to undergraduates from all majors who are interested in teaching in California elementary schools. Through this program, prospective elementary school teachers gain early field experience in the schools and learn more about the profession. Advising includes information on state requirements that are best met before graduation. For more information, contact the Office of Interdisciplinary Programs; 3116 Interdisciplinary Building South; or call (951) 827-2743.

**Veterinary Medicine** The course work at UCR is designed to prepare students to meet the requirements for admission to California's veterinary programs, the School of Veterinary Medicine at UC Davis, and the Western University of Health Sciences in Pomona. Students should consult the Health Professions Advising Center (visit [hpac.ucr.edu](http://hpac.ucr.edu)), the UC Davis General Catalog, or the Western University Web site [www.westernu.edu/veterinary/home.xml](http://www.westernu.edu/veterinary/home.xml) for additional details.



The Chemical Sciences Building is home to the Chemistry Department and some of the best-equipped labs in the nation.

# The Marlan and Rosemary Bourns College of Engineering

Office of Student Academic Affairs  
A159C Bourns Hall  
University of California, Riverside  
Riverside, CA 92521-0144  
(951) 827-ENGR (3647); <http://student.engr.ucr.edu/>

The Marlan and Rosemary Bourns College of Engineering emphasizes fundamental disciplines of engineering and computer science, introducing students to the new technologies necessary for today's highly technical environments.

The vision of the Bourns College of Engineering is to become a nationally recognized leader in engineering research and education. Its mission is to

- Produce engineers with the educational foundation and the adaptive skills necessary to serve rapidly evolving technology industries
- Conduct nationally recognized engineering research focused on providing a technical edge for the United States
- Contribute to knowledge in both fundamental and applied areas of engineering
- Provide diverse curricula that will instill in our students the imagination, talents, creativity, and skills necessary for the varied and rapidly changing requirements of modern life and to enable them to serve in a wide variety of other fields that require leadership, teamwork, decision making, and problem-solving capabilities
- Be a catalyst for industrial growth in the Inland Empire region of Southern California

The majors offered by the college are based on the needs of the practicing professional and are founded on a solid core of mathematics and the sciences. Breadth in the educational experience is represented by requirements in arts, humanities, and social sciences and by emphasis on oral and written communication skills. The principles and practice of engineering and computer science are provided in lecture and related laboratory courses. All students must choose a set of technical electives, emphasizing synthesis and design, to complete their undergraduate programs.

## Majors

A major is a coordinated group of upper-division courses (courses numbered 100–199) in a field of specialization. The major may be a group of upper-division courses within a single department or program, or a group of related courses from several departments or programs. Before enrolling in upper-division courses, students may be required to gain appropriate knowledge by completing specific prerequisite courses. With the assistance of a departmental advisor, students are expected to select lower-division courses which prepare them for the advanced studies they propose to follow.

## Change of Major or Double Majors

A student in good standing may request to change from one major to another by filing a Major Change Petition with the Office of Student Academic Affairs. Major Change criteria can be found at <http://student.engr.ucr.edu/policies/requirements/majorchange.html>.

A student in good standing may elect to take a second major within the college. The student must file a declaration of a second major with the Office of Student Affairs. A course used to satisfy the requirements for one major may be used to fulfill the requirements of a second major as well. However, of the required upper-division units, a minimum of 24 must be unique to each major, and both majors must be completed within the maximum unit cap of the primary Engineering major.

A student in good standing may elect to take a second major in another college. A declaration of such a second major must be signed by the deans of both colleges and filed by the student with the primary college.

## Bourns College of Engineering Undergraduate Majors and Options

Major	Degrees
Bioengineering <sup>2</sup>	B.S.
Business Informatics <sup>1</sup>	B.S.
Chemical Engineering <sup>2</sup>	B.S.
Biochemical Engineering	
Bioengineering	
Chemical Engineering	
Nanotechnology	
Computer Engineering <sup>2</sup>	B.S.
Computer Science <sup>2</sup>	B.S.
Electrical Engineering <sup>2</sup>	B.S.
Environmental Engineering <sup>2</sup>	B.S.
Air Pollution Control Technology	
Water Pollution Control Technology	
Materials Science and Engineering	B.S.
Mechanical Engineering <sup>2</sup>	B.S.
Design and Manufacturing	
Energy and Environment	
General Mechanical Engineering	
Mechanics of Materials and Structures	

<sup>1</sup>Joint with the School of Business Administration

<sup>2</sup>A combined B.S.+M.S. program is offered in this discipline (designed to lead to a B.S. degree as well as an M.S. degree in five years).

A student will meet requirements of both primary and secondary majors and the college requirements of the primary major, if they are both in the same baccalaureate class. If the two majors lead to different degree designations (B.S. and B.A.), that fact will be noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a double major program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements of both majors must be met. A course used to satisfy the requirements for one major may be used to fulfill the requirements for a second major as well. However, of the required upper-division units, a minimum of 24 must be unique to each major, and both majors must be completed within the maximum unit cap of the primary Engineering major. A student who has declared a double major may graduate in one major upon the completion of all requirements for that major but may not continue in the university for completion of the second major. For details, see <http://student.engr.ucr.edu/policies/requirements/doublemajors.html>.

## Minors

The Bourns College of Engineering currently has a minor in Computer Science. Minors in the college shall consist of not fewer than 20 nor more than 28 units of organized upper-division courses. No more than 4 units of 190–199 courses may be used in fulfilling the upper-division unit requirement for a minor. Overlap may occur between the upper-division course requirements of the major and the minor only to the extent permitted by the department, programs, or interdisciplinary committee offering the minor, or the college of the minor. Courses used, or prerequisite to those used, in fulfilling the minor may be taken on an "S/NC" basis only on approval of the dean. The department, program, or interdisciplinary committee offering the minor is responsible for student and administrative issues pertaining to the minor. Students must file a declaration of a minor at least two quarters before graduation and must be in good academic standing at the time of filing. A minor requires the signature of the department chair or chair of the faculty committee which supervises the minor and the signature of the dean of the college. A GPA of at least 2.00 in upper-division courses in the field of the minor is a graduation requirement. When all other requirements for graduation have been met, the student will be graduated without the minor if the minimum GPA in the minor field has not been met.

## University Honors Program

For a description of the University Honors Program, see Educational Opportunities section in the section Introducing UC Riverside. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section of this catalog.

## Admission to Majors

**Admission of Freshmen** Prospective Bourns College of Engineering students must complete high school programs that meet UC requirements as described in the Undergraduate Admission section of this catalog.

In addition, appropriate high school mathematics and science course work should include the following:

Course Work	Years
Algebra	2
Plane Geometry	1
Trigonometry (often contained in Precalculus or Algebra II, strongly suggested)	1/2
Chemistry or Physics, with laboratory (preferably both)	1

A supplemental screening process for majors in the Bourns College of Engineering places emphasis on the GPA earned in college preparatory course work, especially mathematics and science, and on aptitude test scores. Qualification for first-year calculus is also expected. UC-eligible students not qualifying for the preferred major are considered for admission to their alternate major.

Application should be made during the priority filing period (November 1–30).

**Transfer Students** All transfer students must meet the UC requirements for admission as described in the Undergraduate Admission section of this catalog. The Bourns College of Engineering accepts completion of IGETC as satisfying the majority of the college's breadth requirements for transfer students. Some additional breadth coursework may be required after enrollment at Bourns. For more information on BCOE breadth requirements, go to <http://student.engr.ucr.edu/policies/requirements/breadth.html>.

However, prospective applicants are strongly encouraged to focus instead on preparatory course work for their desired major, such as mathematics, science, and other technical preparatory course work, rather than on IGETC completion. Strong technical preparation is essential for success in the admissions process, and subsequently, in all coursework at Bourns.

Students intending to transfer to engineering majors are expected to complete the equivalent of UCR course work required in the first two years of the programs and to apply for transfer starting with their junior year. Specific information on transfer requirements may be obtained from the Office of Student Academic Affairs, (951) 827-ENGR (3647) or at [www.engr.ucr.edu/undergrads/transferring/](http://www.engr.ucr.edu/undergrads/transferring/).

**Financial Assistance** The Bourns College of Engineering awards several scholarships to its students each year from funds provided by corporate and private sponsors. Other scholarships are available. Further information may be obtained by calling the Office of Student Academic Affairs, (951) 827-ENGR (3647).

**Special Facilities** See Research Opportunities in the section About UC Riverside in this catalog for a detailed description of the following centers:

- Center for Bioengineering Research
- Center for Environmental Research and Technology
- Center for Nanoscale Science and Engineering
- Center for Research in Intelligent Systems (including the Visualization and Intelligent Systems Laboratory)
- Center for Ubiquitous Communication by Light

## Degree Requirements

Students in the Bourns College of Engineering must meet three levels of requirements for the Bachelor of Science degree: general university requirements, college requirements, and major requirements.

## General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section. For other UCR regulations including repetition of courses, concurrent enrollment, scholarship regulations, and incomplete (I) grades, see the Policies and Regulations section of this catalog.

In addition to the above general university requirements, the Bourns College of Engineering has the following unit requirement.

## Unit Requirement

Most of the majors in this college require more than the nominal university requirement of 180 units for graduation. No more than 6 units of physical education activity may be counted toward this requirement. However, after having credit for 216 units or 120 percent of the units required for the major, a student is not permitted to continue except by approval of the dean when specific academic or professional reasons are involved.

## College Breadth Requirements

All undergraduate students in the Bourns College of Engineering are required to satisfy the Campus Graduation Requirements mandated by the Academic Senate under Regulation R6. Detailed requirements are available in the Office of Student Academic Affairs or at <http://student.engr.ucr.edu/policies/requirements/breadth.html>. Internships and independent study courses may not be used to satisfy breadth requirements.

### Breadth Requirement Unit Summary

#### For the B.S.

English Composition	Varies
Humanities	12
Social Sciences	12
Ethnicity (4 units) <sup>1</sup>	~
Natural Sciences and Mathematics	20

<b>Total Units</b>	44 plus English Composition
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<sup>1</sup>The 4-unit ethnicity requirement can be applied to the Humanities or Social Science requirement, depending on content.

For the following requirements, a course is defined as a block of instruction that carries credit of 4 or more units.

To provide depth in satisfying breadth in the humanities and social sciences, courses must meet the following criteria:

1. At least two of the humanities and/or social science courses must be upper division.
2. At least two courses must be from the same subject area (for example, two courses in History), with at least one of the two being an upper-division course.

## English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college-level instruction in English Composition with no grade lower than "C." UCR's sequence is ENGL 001A, ENGL 001B, and one of ENGL 001C or ENGL 01SC, or an approved

alternative under Writing Across the Curriculum. Transfer students who have credit for one semester of English Composition from another institution must take two additional quarters (i.e., ENGL 001B and either ENGL 001C or ENGL 01SC).

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy ENGL 001A; they must complete ENGL 001B and either ENGL 001C or ENGL 01SC. Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied ENGL 001A and ENGL 001B; they must complete ENGL 001C or ENGL 01SC or an approved alternative under Writing Across the Curriculum.

Students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and ENGL 001A, ENGL 001B, and ENGL 001C or ENGL 01SC or an approved alternative under Writing Across the Curriculum is completed with a satisfactory GPA. A student may not receive baccalaureate credit for any work in English Composition taken prior to completing the Entry Level Writing requirement.

### Humanities: 12 units

Courses used to fulfill the Humanities requirements must be selected from an approved list available in the Office of Student Academic Affairs.

1. One course in World History
2. One course in one of the areas of Fine Arts, Literature, Philosophy, or Religious Studies
3. One additional course chosen from
  - a) History, the Fine Arts, Literature, Philosophy, Religious Studies
  - b) A foreign language at level 3 or above
  - c) Humanities courses offered by Ethnic Studies, Creative Writing (courses in journalism), Humanities and Social Sciences, Latin American Studies, Linguistics, or Women's Studies

No course used to satisfy the English Composition requirement can be applied toward Humanities credit. A list of approved courses is available in the Office of Student Academic Affairs.

### Social Sciences: 12 units

Courses used to fulfill the Social Sciences requirements must be selected from an approved list available in the Office of Student Academic Affairs.

1. One course from Economics or Political Science
2. One course from Anthropology, Psychology, or Sociology
3. One additional social science course offered by Ethnic Studies, Geography (cultural geography courses), Human Development, or Women's Studies, or one of the disciplines in 1. or 2. above.

To provide depth in satisfying breadth in the humanities and social sciences, at least two of the courses must be upper division, and at least two courses, one of them upper division, must be from the same subject area. The list of approved courses is available in the Office of Student Academic Affairs.

### Ethnicity: 4 units

Courses used to fulfill the Ethnic Studies requirement must be selected from an approved list available in the Office of Student Academic Affairs.

One course dealing with general concepts and issues in the study of race and ethnicity in California and the United States. Courses that satisfy this requirement must concentrate on one or more of four principal minority groups (African American, Asian American, Chicano/Latino, and Native American). These courses must be comparative in nature, analyzing the minority group experience within the present and historical context of other racial and ethnic groups, such as European-American minorities. The courses are to be offered by or cross-listed with the Department of Ethnic Studies. The list of approved courses is available in the Office of Student Academic Affairs.

### Natural Sciences and Mathematics: 20 units

Courses used to fulfill the Natural Sciences and Mathematics requirements must be selected from an approved list available in the Office of Student Academic Affairs.

1. One course in Biological Sciences
2. One course in Physical Sciences. No course in cultural geography may be used.
3. One course in Mathematics or Computer Science or Statistics
4. Two additional courses in the Biological or Physical Sciences

Check with the Office of Student Academic Affairs for the courses that fulfill the biological sciences, physical sciences, and additional sciences. In some cases, these are satisfied by requirements of the major. The mathematics/computer science/statistics requirement is always satisfied by a major requirement.

### Major Requirements

Detailed requirements for each major are found under the department listings in the Programs and Courses section of this catalog, and are available from the Office of Student Academic Affairs, (951) 827-ENGR (3647). A GPA of at least 2.00 ("C") in upper-division courses taken in the major field is required for graduation. Not more than 9 units of courses in the 190-199 series may be counted in fulfilling the upper-division units needed for the major.

### College Policies and Procedures

For detailed information on UCR policies and regulations see the Policies and Regulations section of this catalog.

### College Regulations

Detailed information and specifics with regard to the college regulations governing undergraduate student status as approved by the faculty and contained in the *Manual of the Riverside Division of the Academic Senate* can be obtained from the Dean's Office.

### Student Responsibility

Students are responsible for meeting deadline dates regarding enrollment, add/drop, change of grading basis, credit by examination, withdrawal, declaration of candidacy, and other procedures. The dates are at [classes.ucr.edu](http://classes.ucr.edu) and must be observed. Students are responsible for ensuring that they meet all requirements for graduation and that they attend the undergraduate faculty advisor's annual forum. Students are also responsible for obtaining their grades, selecting an appropriate collection of courses, and confirming their enrollment by relevant deadlines. Academic advising can be obtained in the Office of Student Academic Affairs.

### Faculty Advisors

All Bourns College of Engineering students are advised on a regular basis. In addition, each department designates a faculty undergraduate advisor who is the primary contact in the student's areas of academic interest. Faculty advisors assist students in their undergraduate careers, as appropriate, and are also mentors in the student's areas of interest.

### Course Enrollment

Students should plan their program of study carefully, in consultation with an academic advisor. Class schedules of fewer than 12 units must have the approval of the associate dean of the college.

Students who have not met the Entry Level Writing Requirement must enroll in an Entry Level Writing or qualifier course, as determined by their placement, during their first quarter of residency.

Students must attend class meetings. Students who do not attend in accordance with any published requirement listed at [classes.ucr.edu](http://classes.ucr.edu) or on a course syllabus may be dropped from the course.

Students may add or drop a course via Growl through the second week of instruction. Beginning the third week of instruction, students must file an Enrollment Adjustment Form to make changes and obtain required approvals. During the third week of classes, students may, with the consent of the instructor and the approval of their academic advisor, add a course. Students may drop a course until the end of the sixth week of instruction, but courses dropped after the second week of instruction require an academic advisor's signature and result in a "W" (for withdrawal) noted on the transcript. Changes in enrollment after deadlines published at [classes.ucr.edu](http://classes.ucr.edu) require the approval of the associate dean of the college.

A student on probation may enroll for more than 13 quarter units only with the consent of the associate dean of the college.

With the approval of the associate dean, students may withdraw from the university at any time prior to the end of instruction.

Any changes in a student's class schedule not covered by the above regulations must have the approval of the associate dean.

### **Enrollment on a Satisfactory/No Credit Basis**

A student in good standing may enroll and receive credit for courses graded "S." However, the "S/NC" grading system cannot be used for any course that is used to fulfill major or breadth requirements, except for any required course which is restricted to "S/NC" grading and up to 8 units of courses in the humanities and social sciences. Exceptions to this policy may be granted, upon petition, by the student's advisor and the Executive Committee.

Students may change their grading basis in a course from letter grading to "S/NC" (or vice versa) up to the end of the eighth week of instruction.

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.

### **Credit by Examination**

A student may petition for the privilege of examination for degree credit without formal enrollment in a particular course, but must be in residence and not on academic probation. Arrangements for examination for degree credit must be made with the student's advisor. Approvals of the advisor, the dean of the college, and the instructor who is agreeing to give the examination are necessary before the examination may be given. The results of all examinations for degree credit are entered on the student's record as if the student had actually taken the courses of instruction.

### **Expected Progress for Undergraduate Students**

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. Lack of adequate progress may jeopardize continued registration. Students can access their advisory degree check on Growl (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)).

### **Declaration of Candidacy**

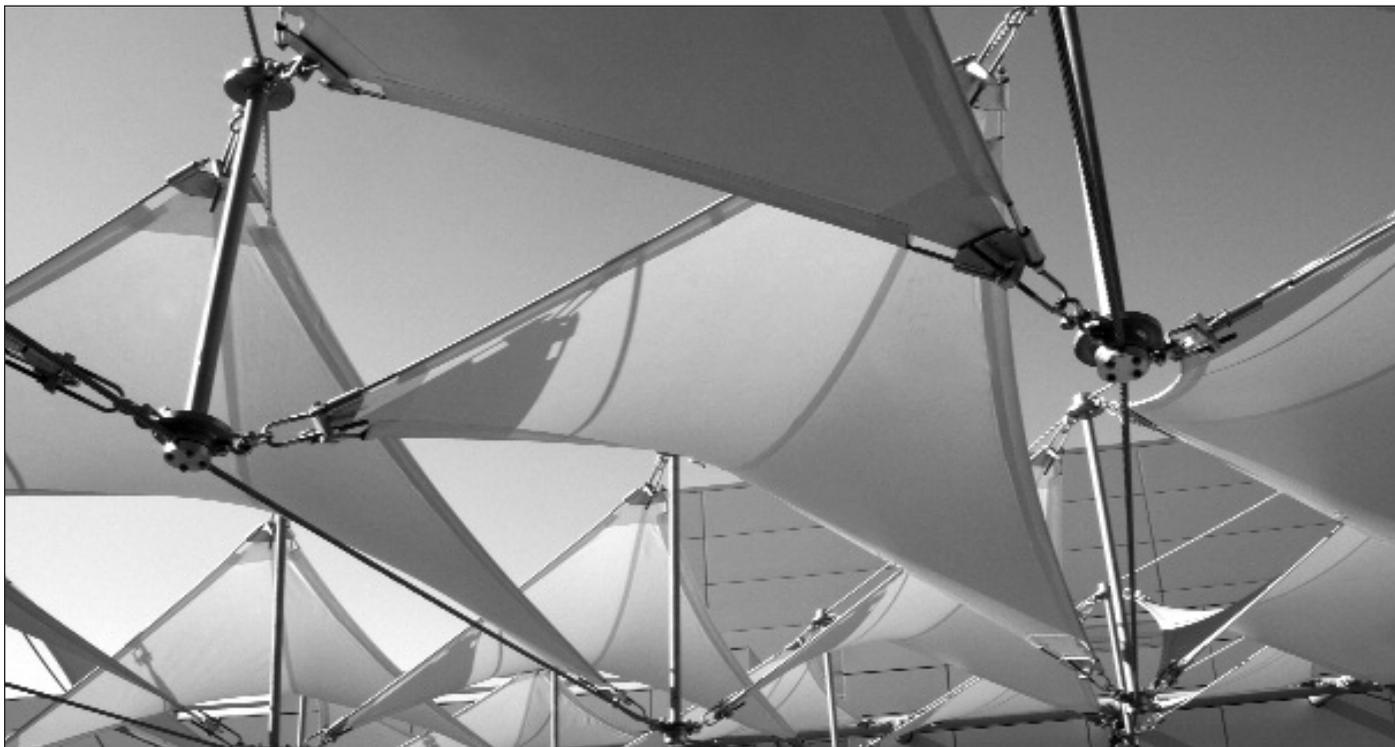
Applications for graduation are available in the Office of Student Academic Affairs and must be filed by the deadline established for the quarter in which graduation is intended. The deadline for filing applications for graduation is listed at [classes.ucr.edu](http://classes.ucr.edu) each quarter. Applications are not accepted after the deadline established for the quarter. If for any reason a student does not meet the requirements for graduation after announcing candidacy, or if a student fails to meet the deadline for filing, an application must be filed for a subsequent quarter.

### **California Teach Science/Mathematics Initiative (CaTEACH-SMI)**

California Teach-Science Mathematics Initiative (CaTEACH-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CaTEACH-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the SMI & Alpha Center Apprentice Programs, to explore STEM teaching as a career option. Through CaTEACH-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CaTEACH-SMI Resource Center provides future STEM teachers with material and financial resources which includes the NSF Noyce Scholarship Program, to promote planning and professional development towards a science/mathematics education career.

For more information about the CaTEACH-SMI program, please visit <http://smi.ucr.edu> or at the Resource Center at 1315 Pierce Hall.



# The School of Business Administration

Student Affairs:

Graduate Programs:

The A. Gary Anderson Graduate School of Management:

102 Anderson Hall, South

(951) 827-6200; fax: (951) 827-2055

Undergraduate Programs:

Office of Undergraduate Business Programs:

2340 Olmsted Hall

(951) 827-4551; fax: (951) 827-5061

[soba.ucr.edu](http://soba.ucr.edu)

## Mission Statement

The School of Business Administration is composed of The A. Gary Anderson Graduate School of Management and the Undergraduate Business Programs. The school is dedicated to the pursuit of excellence in substantive scholarly research enhancing the world's base of knowledge about organizations, their environments, and their management, and to the transmission of this knowledge through quality educational programs to students, alumni, business managers, and the public. SoBA is accredited by AACSB International - The Association to Advance Collegiate Schools of Business.

## The School

The School of Business Administration (SoBA) emphasizes growing strengths in the areas of marketing, supply chain management, accounting, and finance. The school resides in a 30,000-square-foot home featuring state-of-the-art research and teaching facilities.

The SoBA Microcomputer Facility offers software packages in statistics, databases, spreadsheets, financial planning, management science, econometrics, graphics, word processing, and Internet connections. The facility is used for teaching, class demonstrations, theses, and research projects. Students learn computing skills in SoBA courses with special computing requirements, and in optional seminars.

The UCR Library, with more than 2 million bound volumes, 13,000 serials, and 1.6 million microforms, including extensive literature in the management field, provides substantial support for student and faculty research.

Student evaluations of courses are an important part of the evaluation of curriculum and faculty performance.

## Undergraduate Program in Business Administration

The School of Business Administration offers an upper-division major in Business Administration intended for students who seek a professional education in the functional fields of private sector management. Students who are admitted into the Pre-Business program during their freshman and sophomore years receive advising through the College of Humanities, Arts, and Social Sciences (CHASS). After admission to the major, students are advised by the SoBA Undergraduate Business Programs Office. In addition to administering the program, SoBA also teaches courses in the functional areas of management such as finance, accounting, human resources management, marketing, operations and supply chain management, and management information systems. The B.S. degree in Business Administration is awarded by The School of Business Administration. SoBA policies, as detailed below, align with those of the College of Humanities, Arts, and Social Sciences.

## Majors

A major is a coordinated group of upper-division courses (courses numbered 100-199) in a field of specialization. The major may be a program of upper-division courses within a single department (departmental major), a group of related courses involving a number of departments (interdisciplinary major),

or a group of courses chosen to meet a special interest.

Before enrolling in certain upper-division courses, students may be required to gain appropriate knowledge by completing specific prerequisite courses. With the assistance of a departmental advisor, students are expected to select lower-division courses that prepare them for the advanced studies they propose to follow.

## Choosing a Major, Undeclared Majors

While freshmen may choose an academic major on entering UCR, those who are unsure about specific academic goals may request to be admitted to CHASS as undeclared. These students often take introductory courses in the natural sciences, social sciences, humanities, and fine arts while searching for an area that most excites their interest. Undeclared majors are encouraged to meet with an advisor in the Student Academic Affairs Office in CHASS about their selection of courses.

Students with 90 or more units toward a degree must declare a major. To declare a major, students must obtain approval from the Student Academic Affairs Office by filing a Petition for Declaration of Major. Students who do not declare a major by 90 or more units may have a hold placed on their registration.

## Double Majors

Students can declare a second major in a department or program of another college. Changes are not permitted while on academic probation or during the final senior year (135 units or more). Both majors must be completed within the maximum limit of 216 units, and approval must be obtained from advisors in both departments or programs. In such cases, all course requirements must be completed for each of the two majors chosen. One of the two majors must be designated as the primary major for the purpose of satisfying breadth or general education requirements. No more than 8 upper-division units may count for both majors simultaneously.

A declaration of two majors in different colleges must be signed by the deans of the colleges concerned and filed by the student with the college of the principal major. If the two majors lead to different degrees (B.S. and B.A.), that fact will be noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements for both majors must be met.

Students wishing to declare a second major must present an outline to the SoBA Undergraduate Business Programs Office, indicating which major will be used to satisfy breadth requirements and any overlap courses between the two majors.

## Internships, Independent Projects and Student Research

The School of Business Administration student can often practice the subject, as well as read about it. Many undergraduates have the opportunity to work with a faculty member on a research project, and many departments offer field work and internship courses. In these courses, students combine several hours per week of experience in an agency or firm with study of related academic materials and participation in a seminar, where formal knowledge and practical experience are related to one another.

Normally, each local internship does not count for more than 4 or 5 units in a single term, larger numbers of units being reserved for quarter-away internships. Petitions for credit beyond 5 units in a single quarter for a local internship must have the sponsoring agency's approval and a written justification by the student's faculty sponsor. All such requests require the associate dean's approval.

A maximum of 16 units of credit toward the bachelor's degree may be obtained through internship courses, with a maximum of 12 units of internship scheduled in a single quarter for quarter-away situations. Students who are on academic probation may not enroll in internship courses.

## Transfer of Majors, Changing Majors

Students in good academic standing can petition to transfer from another college to The School of Business Administration. The petition must be approved by the Undergraduate Business Programs Office before the change can be processed by the Office of the Registrar. Changes are not permitted while on probation or during the final senior year (135 units or more).

Students who fail to attain a GPA of 2.00 ("C") in preparation for the major or courses required for the major may be denied the privilege of entering or continuing in that major.

## Minor in Business Administration

The School of Business Administration offers a minor; however, no student is required to take a minor. Minors are not degree-granting majors; they are sequences of supplemental courses designed to enhance work in certain areas. Any minor may be taken jointly with any departmental or interdepartmental major. Minors in the college shall consist of not fewer than 16 nor more than 28 units of organized upper-division course work. No overlap may occur among courses used to satisfy upper-division course requirements for a major and a minor. A GPA of at least 2.00 is required in upper-division courses in the field of the minor.

A minor is a set of courses focused on a single discipline or an interdisciplinary thematic area. There can be no substitution for the courses listed as constituting a minor without approval of the governing department or committee. There is no limit on the number of minors a student can declare. Students must declare the minor(s) before their final degree check before graduation by completing a petition with the Student Affairs Office in the College of Humanities, Arts, and Social Sciences, the College of Natural and Agricultural Sciences, or the Bourns College of Engineering, depending on their major. Prior approval by the department or committee offering the minor is required. The minor is noted on the transcript at the time the degree is conferred.

## University Honors Program

For a description of the University Honors Program, see Educational Opportunities in the front of this catalog. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section.

## Undergraduate Pre-Business Program

Pre-Business is a two-year program that prepares students to apply to the Business Administration major. Students who elect Pre-Business are advised in the College of Humanities, Arts, and Social Sciences during their freshman and sophomore years. Students who elect Pre-Business must gain admission to Business Administration by the time they have earned 90 units.

## Degree Requirements

Students in The School of Business Administration must meet three levels of requirements for the Bachelor of Science degree: general university requirements, college requirements, and major requirements.

## General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section. In addition, The School of Business Administration has the following requirements and limitations.

## Unit Requirements

Students must satisfactorily complete for credit a minimum of 180 units for the bachelor's degree. A maximum of 216 units is allowed. After having credit for 216 units, students are not permitted to continue except in cases approved by the associate dean in which specific academic or professional reasons are involved.

## Credit Limitations

Transfer students with credit from other institutions (advanced standing credit), receive a transfer profile from the Office of Undergraduate Admissions. The Undergraduate Business Programs Office evaluates the course work, indicating how the transferable credits are applied toward the degree. However, the following credit limitations may reduce the total number of units which apply toward the degree in The School of Business Administration. Students should meet with an academic advisor in their major for questions regarding transfer credits.

The following credit limitations apply for all students enrolled in the college:

1. After completing 105 quarter units at a community college, students are not allowed further units for courses completed at a community college.
2. No more than 6 units in physical education activity courses may be applied toward the 180-unit requirement for the bachelor's degree.
3. No 400 series courses and not more than three courses in the 300 series of courses may be counted toward the 180 unit requirement for the bachelor's degree.
4. No more than 5 units of credit may be taken per quarter in special studies courses. See specific restrictions under each departmental listing regarding credit toward the major in special studies courses.

## College Breadth Requirements

The Undergraduate Business Programs Office, in consultation with the Executive Committee of the School of Business Administration, determines which courses apply to the following requirements. It is the student's responsibility to verify those courses that fulfill these subject requirements. To search for courses that meet specific breadth requirements, visit [classes.ucr.edu](http://classes.ucr.edu).

Courses taken in the department or program of a student's major (including courses cross-listed with the major) may not be applied toward the breadth requirements. However, courses outside the major discipline, but required for the major, may be applied toward satisfaction of these requirements. Students who elect a double major may apply courses in one of the majors toward satisfaction of the breadth requirements. For the following requirements, a course is defined as a block of instruction which carries credit of 4 or more units.

No course may be applied to more than one breadth requirement, with the exception of the course taken to meet the Ethnicity requirement. Internship and independent studies courses may not be used to satisfy breadth requirements.

### The School of Business Administration Breadth Requirement Unit Summary

#### For the B.S.

English Composition	Varies
Humanities	20
Social Sciences	16
Ethnicity (4 units) <sup>1</sup>	—
Foreign Language (level 3)	12
Natural Sciences and Mathematics	20
Total Units	68 plus English Composition

<sup>1</sup>The 4-unit ethnicity requirement can be applied to either the Humanities or Social Sciences requirement, depending on content.

## English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college level instruction in English Composition with no grade lower than "C." Students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and ENGL 001A, ENGL 001B, ENGL 001C is completed with satisfactory GPA.

Transfer students who have credit for one semester of English Composition from another institution are required to take two additional quarters, i.e., ENGL 001B and ENGL 001C.

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy ENGL 001A; they must complete ENGL 001B and ENGL 001C.

Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied ENGL 001A and ENGL 001B; they must complete ENGL 001C.

In lieu of ENGL 001C, students can complete their last quarter of the English Composition requirement by earning a "C" or better in BUS 100W. (As a prerequisite to either course, students must earn a "C" or better in ENGL 001B.)

## Humanities: 20 units

### For the B.S. degree

1. One course in World History (At UCR, courses that satisfy this requirement are HIST 010, HIST 015, or HIST 020.)
2. One course from the following:
  - a) Fine arts (Art, Art History, Dance, Media and Cultural Studies, Music, Theatre, Creative Writing courses in poetry, fiction, or playwriting)
  - b) Literature (taken in the departments of English, Comparative Literature and Foreign Languages, or Hispanic Studies)
  - c) Philosophy
  - d) Religious Studies
3. Three additional courses from the following:
  - a) History, the Fine Arts, Literature, Philosophy, Religious Studies
  - b) A foreign language at level 3 or above (Courses used in fulfillment of the foreign language requirement may not be used to meet this requirement.)
  - c) Humanities courses offered by Ethnic Studies; Creative Writing (courses in journalism); Humanities, Arts, and Social Sciences Interdisciplinary; Latin American Studies; Linguistics; or Women's Studies

## Social Sciences: 16 units

1. One course in Economics or Political Science
2. One course in Anthropology, Psychology, or Sociology
3. Two additional social science-related courses from Comparative Ancient Civilizations, Ethnic Studies; Environmental Sciences; Geography (cultural geography courses); Human Development; Humanities, Arts, and Social Sciences Interdisciplinary; Women's Studies; or one of the disciplines in 1. or 2. above.

## Ethnicity: 4 units

One course focusing on the general concepts and issues in the study of race and ethnicity in California and the United States. Courses that satisfy this requirement must concentrate on one or more of four principal minority groups (African American, Asian American, Chicano/Latino, and Native American). These courses must be comparative in nature, analyzing the minority group experience within the present and historical context of other racial and ethnic groups, such as European-American minorities. The courses are to be offered by or cross-listed with the Department of Ethnic Studies.

Refer to the Programs and Courses section for the courses that fulfill the Ethnicity requirement.

## Foreign Language

Courses in American Sign Language may be used to meet this requirement.

### For the B.S. degree: course level 3 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by majoring in one or more languages) by completing the third-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of "C" or by demonstrating proficiency at the third-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not

yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student's UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit [placementtest.ucr.edu](http://placementtest.ucr.edu) for dates and locations). Credit will be allowed only at the course level for for which they qualify according to the placement exam.

## Natural Sciences and Mathematics: 20 units

1. One course in Mathematics, Statistics, or Computer Science
2. One course in Biological Sciences (Biochemistry, Biology, Botany and Plant Sciences, Entomology, Nematology, or Plant Pathology)
3. One course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural Geography courses)
4. Two additional courses from the areas listed above or in physical and/or biological science courses offered in the Department of Environmental Sciences

## New General Education Concentration Options

Students who choose to satisfy Breadth with the new General Education Concentration Option may choose either the California Concentration or the Climate Change/Sustainability Concentration listed below. One of these concentrations satisfies campus breadth requirements.

### English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college level instruction in English Composition with no grade lower than "C." Students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and ENGL 001A, ENGL 001B, ENGL 001C is completed with satisfactory GPA.

Transfer students who have credit for one semester of English Composition from another institution are required to take two additional quarters, i.e., ENGL 001B and ENGL 001C.

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy ENGL 001A; they must complete ENGL 001B and ENGL 001C.

Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied ENGL 001A and ENGL 001B; they must complete ENGL 001C.

## General Education Options

### A. California Concentration (Total units: 36-37)

1. ENGL 012B; AHS 021; STAT 040, MATH 004 or MATH 005 (12-13 units)
2. Two of: BPSC 021, BPSC 031, GEO 004 (8)
3. ETST 135 or ETST 154 (4)
4. HIST 138 or HIST 140 (4)
5. POSC 198-I (4)
6. HASS 190 (4)

### B. Climate Change/Sustainability Concentration (Total units: 40-41)

1. GEO 011 (4 units)
2. Two of: ENSC 002, BIO 003, GEO 002, PHYS 018 (8)
3. Two of: ENGL 012B, AHS 021, CPLT 025 (8)
4. STAT 040, MATH 004 OR MATH 005 (4-5)
5. Two of: PHIL 117, ANTH 132 or ANTH 137, GEO 160 (8)
6. GEO 198-I (4)
7. GEO 190 (4)

## Ethnicity: 4 units

Unless otherwise noted, students taking a new General Education Concentration Option will still have to satisfy the campus Ethnic Studies requirement.

## Foreign Language

Courses in American Sign Language may be used to meet this requirement.

**For the B.S. degree:** course level 3 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by majoring in one or more languages) by completing the third-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of "C" or by demonstrating proficiency at the third-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student's UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit [placementtest.ucr.edu](http://placementtest.ucr.edu) for dates and locations). Credit will be allowed only at the course level for which they qualify according to the placement exam.

Note, in order to be enrolled in one of the concentrations, students must first see their academic advisor and then receive written approval from Professor George Haggerty, chair of the General Education Advisory Committee.

## Major Requirements

Detailed requirements for the Business Administration major can be found under the department or program listing in the Programs and Courses section of this catalog.

A major in The School of Business Administration shall consist of not fewer than 36 upper-division units. All courses applied toward the major and preparation for the major must be taken for a letter grade unless otherwise approved by the department chair. A 2.00 GPA in upper-division courses in the major is required for graduation. Once enrolled on this campus, students must complete all courses designated for a major in regular or summer sessions at UCR; exceptions to this policy must be approved by the department chair and by the associate dean.

Candidates for the B.S. degree may not receive more than 108 units of credit toward the degree for work taken in the major discipline (i.e., students must take at least 72 units outside the major discipline).

To receive the bachelor's degree, transfer students must complete a minimum of 16 upper-division units in the major on the Riverside campus.

Students who have been away from the university for several terms should consult with their major departmental advisor about the requirements under which they may graduate. See the Catalog Rights Policy for Undergraduate Degrees in the Policies and Regulations section of this catalog.

## College Policies and Procedures

For more information on UCR policies and regulations see the Policies and Regulations section of this catalog.

## College Regulations

Refer to The School of Business Administration Web site at [soba.ucr.edu](http://soba.ucr.edu) for more information on college policies and procedures.

## Student Responsibility

Students are responsible for meeting deadline dates regarding enrollment, add/drop/withdrawal, change of grading basis, credit by examination, declaration of candidacy, and other actions. The dates are online at [classes.ucr.edu](http://classes.ucr.edu) and must be observed. Advising can be obtained in the Undergraduate Business Programs Office, 2340 Olmsted Hall.

## Academic Advising

It is the student's responsibility to meet all graduation requirements: general university, college, and major. Pre-Business students are advised in CHASS Student Affairs (see a list of departmental staff for academic affairs at [chassstudentaffairs.ucr.edu](http://chassstudentaffairs.ucr.edu)). As Pre-Business students are accepted in to the Business Administration program, they are advised by academic advisors in the Office of Undergraduate Business Programs (see a list of departmental staff for academic affairs at [soba.ucr.edu](http://soba.ucr.edu)).

Undeclared students are also advised through the Student Academic Affairs Office in CHASS. A staff of academic advisors is readily available to assist with questions pertaining to academic regulations and procedures, selection of courses which satisfy breadth requirements, major options, and alternatives. Students who need to confer with an advisor about overall degree requirements, academic difficulty, program planning, or assistance in selecting a major need to schedule an appointment with their advisor.

## Course Enrollment

Students are required to register and enroll by the date set by the campus (visit [classes.ucr.edu](http://classes.ucr.edu) for details).

The recommended study load for undergraduate students is 15 to 16 units per quarter. This is the average quarterly load to ensure steady progress for graduation in four years. The minimal program for an undergraduate student to be considered full time is three courses (12 units) per quarter. The normal progress for an undergraduate student is four courses (16 units) per quarter.

A class schedule of fewer than 12 units must be approved by the associate dean (visit [classes.ucr.edu](http://classes.ucr.edu) for details). The college has established enrollment limits beyond which students require academic advisor approval. The limits are as follows: students in good academic standing, 20 units; students on academic probation, 17 units; students on subject-to-dismissal status, 15 units. Students on probation may not take courses on an "S/NC" basis.

After the second week of instruction, students may request changes by petition during a specified period. Petitions must usually be approved by the advisor and also, in the case of adds, by the instructor concerned. Changes to grading basis need advisor approval after the second week of classes. The associate dean must approve any changes in the class schedule requested after the regular petition period.

Courses (including Special Studies courses) can be added through the third week of instruction. Courses dropped after the second week of instruction will appear on the record with a "W" notation, signifying withdrawal. Students can withdraw from courses through the sixth week of instruction. The grading basis for a course can be changed through the eighth week of instruction. After the third week of instruction, a fee is required to file the petition to change the class schedule.

## Enrollment on Satisfactory/No Credit Basis

Undergraduate students in good academic standing may receive credit for courses undertaken and graded "S" up to a limit of one-third of the total units undertaken and passed on the Riverside campus at the time the degree is awarded. Normally, this means no more than 4 units of "S/NC" per quarter. The total also includes courses graded only "S/NC." Courses that are required in, or prerequisite to, a major may not be taken on a "S/NC" basis unless approved by the chair of the major department. Students on special status or limited status may take courses on a "S/NC" basis only with the approval of the associate dean.

A student may elect "S/NC" or delete "S/NC" from a course by filing a petition (enrollment adjustment form) with the Registrar. The deadline is the end of the eighth week of instruction and is listed each quarter at [classes.ucr.edu](http://classes.ucr.edu). This deadline is strictly enforced.

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.

## Repetition of Courses

See Repetition of Courses in the Policies and Regulations section.

## Part-time Study

For details, see Part-Time Study under the Finances and Registration.

## Petitions

A petition is a form representing a student's need or desire to be excepted from any standard rule or regulation in the university. It is the only way to obtain formal approval from the department, the college or school, the Registrar, or whomever has authority over a particular request. Some petitions carry a small fee; others are free.

An approved petition for a waiver or substitution in degree requirements represents an agreement between the student, the college or school, and in some cases, the department chair, granting the student an exception from the existing regulations.

Petitions are also used at UCR to change college or major, enroll in fewer units than regulations permit, make late changes to a class schedule, obtain credit by examination, concurrent enrollment, or withdraw from the university. Petitions for most of these exceptions are available in the Office of Undergraduate Business Programs in Olmsted 2340, and Pre-Business and undeclared students can obtain these petitions in the Student Academic Affairs Office in CHASS. Please note that petitions for retroactive actions more than one year old will not be approved.

## Credit by Examination

To earn credit for a course by examination without formal enrollment in that course, students must be in residence and in good academic standing.

Before the examination may be given, arrangements and approval for examination for degree credit must be made with the instructor appointed to give the examination, a faculty advisor (if the major department requires it), and the associate dean. Petitions must be filed with the Office of the Registrar no later than the third week of instruction. Credit by examination is not allowed for English Composition courses.

The results of all examinations for degree credit are entered on students' records as though they had actually taken the courses of instruction. There is a \$5 service charge for each petition. The credit by examination procedure may not be used as a means of improving a previous grade.

## Undergraduate Credit for Graduate Courses

Students who have a GPA of at least 3.00 in all courses taken in the university or have shown exceptional ability in a special field may take a graduate course for undergraduate credit with the permission of the instructor concerned. Students must have completed at least 18 upper-division quarter units basic to the subject matter of the course.

## Expected Progress for Undergraduate Students

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. Lack of adequate progress may jeopardize continued registration. Students can access their advisory degree check on Growl (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)).

## Applying for Graduation

To graduate from UCR, undergraduate students must file an application for graduation. Please note that the college no longer accepts the paper application; the online Application for Graduation is available at The School of Business Administration Web site, at [www.soba.ucr.edu](http://www.soba.ucr.edu) and must be submitted by 4 p.m. of the deadline date listed at [classes.ucr.edu](http://classes.ucr.edu). Applications are not accepted after the deadline established for the quarter.

Students should review their remaining requirements on Growl (accessible through [rweb.ucr.edu](http://rweb.ucr.edu)) each quarter. They should also contact their academic advisor two quarters before expected graduation to confirm remaining requirements. Completion of the degree depends upon completion of any work in progress. During the graduation quarter, any changes made to a student's schedule after the third week of instruction should be immediately reported to the academic advisor.

If for any reason a student does not meet the requirements for graduation after filing the application, another application must be filed for the appropriate quarter. Students graduating *in absentia* after an absence of one or more quarters must apply for readmission to the university and file an application for graduation.

All course work, whether taken at UCR or elsewhere, must be completed by the last day of UCR's finals week during the quarter of graduation (no GDs or Incomplete grades). Incomplete, IE, IP or GD grades on the transcript will stop the processing of the degree.

Once the application for graduation is filed, the student's name will be entered on the appropriate degree list. Students who need to amend the prospective quarter of graduation and who have submitted an application for graduation petition must notify the Undergraduate Business Programs Office, in writing, as soon as possible.

## Withdrawals

Students may withdraw from the university prior to the end of instruction, for serious personal reasons, with the approval of the associate dean. Forms are available in the Undergraduate Business Programs Office.

## The A. Gary Anderson Graduate School of Management

**Master of Business Administration Program** Through The A. Gary Anderson Graduate School of Management, the SoBA offers a professional graduate program leading to the Master of Business Administration (M.B.A.) degree. The program is offered at the UCR campus. The school also offers an Executive Master of Business Administration (E.M.B.A.) program at the UCR Palm Desert Graduate Center.

The M.B.A. curriculum prepares students to excel in a competitive environment marked by unprecedented challenges and technological advances. Communication and computer skills are incorporated into a global approach to both the art and science of management. Most elective courses are seminar size and encourage participative learning. Computers and software are used extensively for teaching and effective management decision making. An internship program assists students in obtaining experience in their professional fields. In addition to regularly scheduled course work during the day, courses are offered in the evening to permit career professionals to pursue the M.B.A. part time. The mixture of career professionals and recent baccalaureate graduates provides a stimulating and well-rounded classroom environment.

The **M.B.A. curriculum** on the Riverside campus balances the art and science of management, with a particular emphasis on managing through information, and recognizes the global context of management. The curriculum also emphasizes growing strengths in marketing, accounting, and finance. The first-year core courses of the two-year M.B.A. program provide a strong integrated foundation in the common body of knowledge for management. Thereafter, students take 28 to 36 units of electives offered in various fields, and complete a required internship, capstone course, and a thesis or case analysis. In addition to regularly scheduled course work during the day, course work is offered in the evening to permit career professionals to pursue an M.B.A. degree on a part-time basis.

The **E.M.B.A. program** is a self-supported program that is offered at the UCR Palm Desert Graduate Center (PDGC) for working professionals with a minimum of seven years experience performing in a leadership or management role. This program focuses on an interdisciplinary structure and incorporates three one-week residential courses and a specific focus on general management. The E.M.B.A. program meets on alternate week-ends over a 20 month period. Completion of the program results in the awarding of the MBA degree. This is a full-time program attended in an accelerated fashion. Candidates spend extended time in the classroom with fewer visits to campus. All students must complete a nondegree credit workshop in communications, leadership, teams, and ethics.

The E.M.B.A. program uses a common background of group and individual coaching to integrate course materials, improve learner effectiveness, and create a career action plan.

An MBA Student Association represents student interests at faculty meetings and arranges student activities.

The **Interdepartmental Graduate Program in Management (IGPM)** offers both the Master of Arts (M.A.) degree (comprehensive examination Plan II) and the Doctor of Philosophy Degree (Ph.D.). Concentrations are offered in two major field areas, Marketing and Strategic Management and Organizations

SMO). The Interdepartmental Graduate Program in Management (IGPM) trains doctoral students in the design and execution of original research in Management. While an M.A. degree may be earned en route to the Ph.D., admissions will only be to the Ph.D. program.

Distinctive features of the IGPM program include: 1) a strong cross-disciplinary focus over and above the multi-departmental structure of SoBA; 2) the opportunity for Ph.D. students to focus on areas of strength in internet marketing, modeling, and decision making; and 3) research support from the UCR Sloan Center for Internet Retailing

## Admission

Admission requirements for the program are similar to requirements for the Graduate Division. In addition to transcripts, applicants should submit test scores from the Graduate Management Admissions Test (GMAT) or General Record Examination (GRE), and three letters of recommendation from persons knowledgeable about the applicant's academic ability and potential for success in the program.

## Certificate in Management

This certificate is awarded jointly by the SoBA and UCR Extension. Satisfactory completion (with a grade of "B" or better) of six courses (plus prerequisite courses, if required) is necessary to earn the certificate. Certificate students complete five required core courses in Management and select one elective by arrangement with the SoBA.

Classes are taught by regular UCR faculty members and are scheduled on the UCR campus both during the day and in the evenings. Permission of the course instructor and the graduate advisor of the SoBA is required before final registration. Students may use the enrollment form inside the back cover of the Extension catalog to mail in their enrollment, or they may enroll in person at the Extension Office. For further information, write to the Coordinator of Certificate Programs, UCR Extension, Riverside, CA 92521-0112, or phone (951) 827-4112.

## Executive Education

In addition to its M.B.A. program, the AGSM offers management training programs for executives, managers, administrators, and other professionals in the private and public sectors. These programs seek to further the professional development of people in management by exposing them to the most recent trends, ideas, and techniques in the field. Many of these programs do not have formal educational prerequisites, since the SoBA is more interested in a candidate's experience record and potential to benefit from the program. These programs are offered as certificate programs, and workshops of shorter duration. Contact SoBA for further information.



The School of Business Administration provides personal interaction between faculty and students, individual attention, and one of the best equipped business school environments in the country.

# The Graduate School of Education

Student Affairs:  
1124 Sproul Hall  
(951) 827-5225; fax (951) 827-3942  
[education.ucr.edu](http://education.ucr.edu)

## Degrees and Credentials

The Graduate School of Education offers credential programs for students preparing for careers in elementary, middle school, and high school teaching; and teaching in classrooms for individuals with mild/moderate and moderate/severe disabilities. The programs prepare students to teach English learners and students from diverse backgrounds. The School offers a Master of Education (M.Ed.) degree with a General Education Teaching Emphasis. This is for qualified students earning a Multiple Subject or Single Subject credential and is generally completed in one academic year and a summer term. In addition, M.Ed. emphases in Autism, Higher Education Administration and Policy, Reading, Special Education, Diversity and Equity are also offered. A combined M.Ed. and credential in the areas of Reading, and Special Education are also available to qualified candidates. The school also offers M.A. and Ph.D. programs in Education, Society and Culture, Educational Psychology (with both General and Quantitative Methodology Specializations), Higher Education Administration and Policy (M.Ed. and Ph.D.), Special Education, and School Psychology. The M.A. in School Psychology may be awarded only to students matriculating in the School of Education Ph.D. programs. The Ph.D. in School Psychology is offered in combination with a Pupil Personnel Services Credential for School Psychology.

## Graduate Study

Curricula are offered through the Graduate School of Education for the M.A., M.Ed. and Ph.D. degrees. These programs require broad training in education and in a cognate field of study. Further information can be found under Education in the Programs and Courses section of this catalog or visit [education.ucr.edu](http://education.ucr.edu).

## Teaching Credential Programs

Students planning to become teachers can pursue the following teaching credential programs in GSOE:

- Multiple Subject (elementary school), in addition, students may add:
  - Bilingual emphasis in Spanish. Requires passage of the Spanish Proficiency Test and coursework in Latino American literature, Latin American culture and history, and bilingual/bicultural education. Students must also complete EDUC 177B.
- Single Subject (specified subject(s) at the middle school and high school level).
- Education Specialist (special education) in the following specialization:
  - Mild/Moderate Disabilities: authorizes service for mild to moderate mental retardation; attention deficit and attention deficit hyperactivity disorders; serious emotional disturbance; and includes specific learning disabilities.
  - Moderate/Severe Disabilities: authorizes autism, deaf-blindness, moderate to severe mental retardation, multiple disabilities, and serious emotional disturbance.

**Admission** Admission to Teacher Education Programs is required in order to complete the professional and graduate level courses. The admission requirements vary depending on the credential specialization but at minimum students need a 3.0 GPA (calculated on the last two years of undergraduate studies), passage of the basic skills requirement, and subject matter competency. Students who want to be considered for an intern program or the M.Ed. General Education Teaching Emphasis have additional requirements. More information is available at [www.education.ucr.edu](http://www.education.ucr.edu).

**California Teach-Science/Mathematics Initiative (CaTEACH-SMI)** California Teach-Science Mathematics Initiative (CaTEACH-SMI) has a goal of addressing the critical need for highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CaTEACH-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the SMI & Alpha Center Apprentice Programs, to explore STEM teaching as a career option. Through CaTEACH-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CaTEACH-SMI Resource Center provides future STEM teachers with material and financial resources which includes the National Science Foundation (NSF) Noyce Scholarship Program, to promote planning and professional development towards a science/mathematics education career.

For more information about the CaTEACH-SMI program, please visit <http://smi.ucr.edu> or at the Resource Center at **1315 Pierce Hall**.



**In the Graduate School of Education, students can pursue a Master of Education (M.Ed.) degree with a General Education Teaching Emphasis. This is for qualified students earning a Multiple Subject or Single Subject credential and is generally completed in one academic year and a summer term.**



# Programs and Courses

## Numbering and Classification

The credit value of each course in quarter units is indicated for each term by a number in parentheses following the title. Departments may indicate the term in which they expect to offer the course by the use of: “F” (fall), “W” (winter), “S” (spring), “Summer.” The Schedule of Classes, at [classes.ucr.edu](http://classes.ucr.edu), published several weeks before each term commences, lists the courses that will actually be offered for that term, along with their class hours and locations.

The class type, such as lecture or laboratory, and number of hours per week are listed in the first line of the description.

The letters “A,” “B,” “C,” and “D” are used with the course numbers to indicate sequential order; they do not necessarily indicate that an earlier quarter in the sequence is a prerequisite to the later quarters; the prerequisites (if any) of a given course are stated in the description of that course. The letter designation “E-Z” immediately following a course number — for example, HIST 191 (E-Z) — indicates different topics offered under a general title; no specific instance of such a course, for example, HIST 191E, HIST 191F, or HIST 191G, may be repeated for credit unless otherwise indicated in the course description. The letters “E” through “Z” have no sequential implications. The letters “H,” “L,” or “P” immediately following a course number usually have special designations: “H” for an honors course, “L” for a laboratory course (usually in the sciences), and “P” for a proseminar. A grade is assigned by the instructor at the end of each term, and credit is granted for each term, except as otherwise noted. Courses are numbered as follows:

- Lower-division:** 001–099; generally recommended for freshmen and sophomores.
- Upper-division:** 100–199; normally open only to students who have completed at least one lower-division course in the subject, or six quarters/four semesters of college work. Credit in special studies courses for undergraduates is limited to 5 units per quarter.
- Graduate:** 200–299; normally open only to students who have completed at least 18 upper-division quarter units basic to the subject matter of the course.

The admission of undergraduates to graduate courses is limited to upper-division students who have an overall scholarship average not lower than “B”; these limits are imposed by the rules of the Graduate Division. However, graduate courses completed before attaining the baccalaureate will not be accepted in partial fulfillment of requirements

for the credential or minimum requirements in the 200 series for the master’s degree, except for undergraduate students who have received approval for backdating their graduate status to cover the session during which such courses were taken. See the Backdating Units section under Policies and Regulations.

4. **Professional courses for teaching credential candidates:** 300–399.

5. **Other professional courses:** 400–499.

## Cross-listed Courses

Cross-listed courses share equivalent course content but are taught by two or more departments. Cross-listed courses generally share a course number, but each course is tied to a specific subject area and department. While prerequisites, unit coverage, and grading basis are identical for cross-listed courses, it may be preferable for students in certain degree programs to enroll under only one of the available subject areas. See an academic advisor to determine which subject area is most appropriate before enrolling in a cross-listed course.

To determine which courses are cross-listed, see individual course descriptions in this catalog or visit [classes.ucr.edu](http://classes.ucr.edu).

## UC Extension Courses

Students may earn credit toward bachelor’s and master’s degrees at the UC through University Extension. Acceptance of such credit is based on requirements of a particular college, division or department. Generally, preference is given to credits from courses numbered 001–099 and 100–199, prefixed by XR, XL, XI, XB, etc., indicating that such courses are intended to replicate regular offerings of a campus of the UC. Also, courses organized by University Extension, numbered 001–099 and 100–199, prefixed only with an X, are acceptable.

Extension credits are treated like transfer units from approved colleges. They apply toward unit requirements for a degree, but they do not count toward the requirements for residence. Resident students in the university must have advance approval from the appropriate dean for enrollment in UC Extension courses.

Credit earned in University Extension courses is not automatically applicable toward requirements for a master’s degree or university-recommended teaching credential and is permitted only in unusual circumstances.

Students desiring such credit should consult with their graduate advisors and the Graduate Division before undertaking such courses.

## Abbreviations

<b>ARBC</b> Arabic Language	<b>CPAC</b> Comparative Ancient Civilizations	<b>GEO</b> Geosciences	<b>MSE</b> Materials Science and Engineering
<b>ARLC</b> Arabic Literatures and Culture	<b>CPLT</b> Languages and Literatures/Comparative Literature	<b>GRST</b> Languages and Literatures/Germanic Studies	<b>MEIS</b> Middle East and Islamic Studies
<b>AHS</b> Art History	<b>CS</b> Computer Science	<b>GRK</b> Greek	<b>MUS</b> Music
<b>ANTH</b> Anthropology	<b>BLCN</b> Conservation Biology	<b>HASS</b> Humanities, Arts, and Social Sciences	<b>NASC</b> Natural and Agricultural Sciences
<b>ART</b> Art	<b>CRWT</b> Creative Writing	<b>HISA</b> History of the Americas	<b>NEM</b> Nematology
<b>AST</b> Asian Studies	<b>DNCE</b> Dance	<b>HISE</b> History of Europe	<b>NRSC</b> Neuroscience
<b>BSWT</b> Basic Writing	<b>ECON</b> Economics	<b>HIST</b> History	<b>PCST</b> Peace and Conflicts Studies
<b>BCH</b> Biochemistry	<b>EDUC</b> Education	<b>HMPG</b> Honors Program	<b>PHIL</b> Philosophy
<b>BIEN</b> Bioengineering	<b>EE</b> Electrical Engineering	<b>ITAL</b> Italian	<b>PHYS</b> Physics
<b>BIOL</b> Biology	<b>ENGL</b> English	<b>JPN</b> Japanese	<b>PLPA</b> Plant Pathology
<b>BLSC</b> Biological Sciences	<b>ENGR</b> Engineering	<b>KOR</b> Korean	<b>PLBL</b> Plant Biology
<b>BMSC</b> Biomedical Sciences	<b>ENSC</b> Environmental Sciences	<b>LABR</b> Labor Studies	<b>PORT</b> Portuguese
<b>BPSC</b> Botany and Plant Sciences	<b>ENTM</b> Entomology	<b>LATN</b> Latin	<b>POSC</b> Political Science
<b>BSAD</b> Business Administration	<b>ENTX</b> Environmental Toxicology	<b>LNST</b> Latin American Studies	<b>PSYC</b> Psychology
<b>BUS</b> Business Administration	<b>ENVE</b> Environmental Engineering	<b>LWSO</b> Law and Society	<b>PBPL</b> Public Policy
<b>BUNF</b> Business Informatics	<b>ETST</b> Ethnic Studies	<b>LNCR</b> Learning Center	<b>RLST</b> Religious Studies
<b>CBNF</b> Cell Biology and Neuroscience	<b>EUR</b> European Culture	<b>LGBS</b> Lesbian, Gay, Bisexual, Intersexual, and Transgender Studies	<b>RUSN</b> Russian Studies
<b>CBNS</b> Cell, Molecular, and Developmental Biology	<b>EEOB</b> Evolution, Ecology, and Organismal Biology	<b>LING</b> Linguistics	<b>SOC</b> Sociology
<b>CMDB</b> Cell, Molecular, and Developmental Biology	<b>FIL</b> Filipino	<b>LTGL</b> Literatures and Languages	<b>SWSC</b> Soil and Water Sciences
<b>CHFV</b> CHASS F1rst Year	<b>FREN</b> Languages and Literatures/French	<b>MATH</b> Mathematics	<b>SEAS</b> Southeast Asian Studies
<b>CEE</b> Chemical and Environmental Engineering	<b>GBST</b> Global Studies	<b>MCBL</b> Microbiology	<b>SPN</b> Spanish
<b>CHE</b> Chemical Engineering	<b>GCEC</b> Global Climate and Environmental Change	<b>ME</b> Mechanical Engineering	<b>STAT</b> Statistics
<b>CHEM</b> Chemistry	<b>GEN</b> Genetics	<b>MCS</b> Media and Cultural Studies	<b>THEA</b> Theatre
<b>CHN</b> Chinese		<b>MGT</b> Management	<b>URST</b> Urban Studies
<b>CLA</b> Classical Studies			<b>VNM</b> Vietnamese
			<b>WMST</b> Women’s Studies
			<b>WRLT</b> World Literature

# Anthropology

**Subject abbreviation: ANTH**

**College of Humanities, Arts, and Social Sciences**

Thomas C. Patterson, Ph.D., Chair  
Department Office, 1334 Watkins Hall  
(951) 827-5524; [anthropology.ucr.edu](mailto:anthropology.ucr.edu)

## Professors

Wendy Ashmore, Ph.D.  
Scott L. Fedick, Ph.D.  
Christine Ward Gailey, Ph.D.  
(Anthropology/Women's Studies)  
Yolanda Moses, Ph.D.  
Sally Allen Ness, Ph.D.  
Susan Ossman, Ph.D.  
Thomas C. Patterson, Ph.D.  
Karl A. Taube, Ph.D.

## Professors Emeriti

Eugene N. Anderson, Ph.D.  
Alan R. Beals, Ph.D.  
Sylvia M. Broadbent, Ph.D.  
Alan G. Fix, Ph.D.  
David B. Kronenfeld, Ph.D.  
Martin Orans, Ph.D.  
Anne Sutherland, Ph.D.  
R. E. Taylor, Jr., Ph.D.  
Carlos G. Véllez-Ibáñez, Ph.D.  
Philip J. Wilke, Ph.D.

## Associate Professors

Sang-Hee Lee, Ph.D.  
Juliet McMullin, Ph.D.  
Christina Schwenkel, Ph.D.

## Assistant Professors

Derick Fay, Ph.D.  
T.S. Harvey, Ph.D.  
Robin Nelson, Ph.D.  
Paul Ryer, Ph.D.

## Majors

Anthropologists study the way diverse groups of people understand and live in various settings ranging from urban environments to rural villages all over the world. They are interested in such questions as: What does it mean to be human? What activities define the social life of groups and how are they related? How do the members of groups communicate? What is the material evidence for their social and biological history? What are the historical, social, political, economic, and environmental forces that have helped to shape the experiences of particular groups of people, both in the past and in the contemporary world? And, how do human societies change and why? Anthropologists apply this knowledge for the benefit of the peoples whose communities they study.

Anthropology includes four broad subfields:

1. Sociocultural anthropology, the comparative study of communities in their local and global contexts
2. Archaeology, the investigation of past societies through their material and written remains
3. Biological anthropology, which focuses on the evolution of human beings as a species and the interaction of human biological variability with culture

4. Linguistic anthropology, which explores the interconnections of language, culture, thought, and social structure

## Career Opportunities

Anthropology prepares students for dealing with the challenges of an increasingly international economy, transnationally connected communities, and multicultural citizenries. Besides helping students hone and refine analytical skills and critical thinking, anthropology helps them recognize the impact of cultural dynamics on interpersonal communication and on the social structures that affect everyone's daily lives. Anthropology majors interested in pursuing graduate studies are excellent candidates for programs in anthropology, business, law, journalism, medicine, social work, urban planning, and almost any other profession that calls for working with people from a variety of backgrounds and in a number of different settings.

The skills and knowledge learned as an undergraduate anthropology major help students understand the connections between people. Anthropology majors who are not planning to pursue graduate or professional studies immediately can forge careers as teachers at the primary and secondary levels; interviewers; recruiters in executive and specialized employment agencies; staff and managers in various local, state, and federal governmental agencies as well as in a variety of national and international non-governmental organizations and community development organizations; archaeological field or laboratory technicians; intercultural communications professionals in hospitals and other organizations; or union organizers.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The Department of Anthropology offers the B.A. and B.S. degrees in Anthropology and the B.A. degree in Anthropology/Law and Society. The B.S. program is intended for those planning professional careers in anthropology or in the related fields mentioned above. The B.A. programs are intended for those desiring a broad liberal arts curriculum.

### Anthropology Major

The major requirements for the B.A. and B.S. degrees in Anthropology are as follows:

1. Lower-division requirements (four courses [at least 16 units])
  - a) ANTH 001, ANTH 002, and either ANTH 003 or ANTH 005
  - b) LING 020

2. Upper-division requirements
  - a) Nine courses (at least 36 units) of upper-division Anthropology for the B.A.; 10 courses (at least 40 units) for the B.S.
  - b) At least one upper-division course in each of the subdisciplines of anthropology:
    - (1) Archaeology
    - (2) Biological anthropology
    - (3) Cultural and social anthropology
    - (4) Linguistics

**Note** Students are strongly urged to take the lower-division requirements in the first two years of university study. Students intending to major in anthropology should work closely with a faculty advisor in planning their programs.

### Anthropology/Law and Society Major

The major requirements for the B.A. degree in Anthropology/Law and Society are as follows:

#### 1. Anthropology requirements

All requirements for the B.A. in Anthropology. See Anthropology Major above for specific requirements.

#### 2. Law and Society requirements (36 units)

- a) PHIL 007 or PHIL 007H
- b) LWSO 100
- c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
- d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
- e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
- f) LWSO 193, Senior Seminar

**Note** For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Anthropology requirements and Law and Society requirements).

### Minor

The Department of Anthropology offers a minor in Anthropology which consists of six upper-division courses (at least 24 units) and appropriate prerequisites as needed.

The courses are to be selected as follows:

1. Two upper-division courses in cultural anthropology from ANTH 102/ AHS 102, ANTH 121, ANTH 122, ANTH 124, ANTH 125, ANTH 127, ANTH 131, ANTH 132, ANTH 134, ANTH 135, ANTH 137, ANTH 138, ANTH 139, ANTH 144, ANTH 149/WMST 149, ANTH 160, ANTH 162, ANTH 163, ANTH 173

(ANTH 001 is the normal lower-division prerequisite for these courses.)

2. Two upper-division courses from any one of the following interdisciplinary areas: (These courses normally entail an appropriate lower-division course in the given subdiscipline.)
  - a) Archaeology
    - (1) Prerequisite: ANTH 003 or ANTH 005
    - (2) Courses: ANTH 110, ANTH 111, ANTH 113, ANTH 117A, ANTH 117B, ANTH 118, ANTH 172, ANTH 178/WMST 178
  - b) Physical/Biological Anthropology
    - (1) Prerequisite: ANTH 002
    - (2) Courses: ANTH 107, ANTH 129, ANTH 146/PSYC 146, ANTH 150, ANTH 158, ANTH 159
  - c) Linguistic Anthropology
    - (1) Prerequisite: LING 020
    - (2) Courses: ANTH 120, ANTH 123, ANTH 167/LING 167
3. One area course from ANTH 115 (E-Z), ANTH 140 (E-Z), ANTH 161/LNST 161, ANTH 164/LNST 164/WMST 164, ANTH 168/ETST 148/LNST 168, ANTH 186/LNST 166
4. One methodological course from ANTH 112, ANTH 114A, ANTH 116, ANTH 155, ANTH 171, ANTH 180A, ANTH 183, ANTH 185

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

The Department of Anthropology offers the M.A., M.S., and Ph.D. degrees in Anthropology.

## Doctoral Degree

The graduate program transforms scholars into professional anthropologists who will variously engage in research, teaching, policy-related and/or administrative activities that benefit the people with whom they work. The program focuses on how people living in various settings participate in and adapt to processes of change and transformation, both historically and in the contemporary world. The faculty is committed to an integrated, socially engaged concept of the discipline. The traditional subfields — sociocultural anthropology, biological anthropology, archaeology, and linguistics — are crosscut by a series of concentrations that constitute areas of strength. The most developed concentrations are (1) the applied anthropology of transnational processes (inequality, migration) and the border and binational communities associated with globalization and the internalization of capital; (2) the archaeology of Mesoamerica and Western North America; (3) cultural and political ecology; and (4) Latin America. The department has close working relationships with other programs on campus.

The department is dedicated to educating the next generation of professional anthropologists. The faculty consists of active research scholars with solid records of publication, conducting original research, obtaining extramural grants, and placing graduate students in regional, national, and international labor markets. Aware of the current structures of employment, faculty prepare students to pursue both academic and nonacademic careers.

**Admission** Applicants must supply GRE General Test scores, official transcripts from all institutions attended since high school, three letters of recommendation, a writing sample, and a personal statement specifying why they wish to undertake and complete graduate training at the UCR Department of Anthropology.

**Course Requirements** During their first year, students complete the year-long seminar sequence ANTH 200A, ANTH 200B, and ANTH 200C (Core Theory in Anthropology). Students must acquire a basic understanding of three of the four subfields (sociocultural anthropology, biological anthropology, archaeology, and linguistics). To fulfill the breadth requirement, students must take at least one graduate course in each of two subfields outside the student's major focus.

**Language Requirement** Students must demonstrate at least a reading knowledge in one language other than English. In some cases, the student's advisor may require knowledge of a second language. The choice of language(s) and the method of demonstrating competence should be determined in consultation with the student's advisor. All students must file a Statement of Plan to Fulfill the Language Requirement by the end of the second quarter of their first year in residency. This includes students who are fully bilingual or whose primary language is not English. Competency may be demonstrated by the following:

1. Placing higher than level 3 in the Language Placement Examination,
2. Receiving a grade of at least "B" or "S" in a reading skills course or level 3 traditional language course, or
3. Alternative certification

In addition, students who plan to conduct fieldwork in a non-English setting must acquire conversational skills in the appropriate language before commencing fieldwork. Because language acquisition is a slow process, students are encouraged to begin language training early in their graduate program.

**Methodological Skills Requirement** Students must demonstrate competency in a qualitative or quantitative methodological skill such as GIS, lithic analysis, statistics, or hieroglyphic analysis. The choice of methodological skill should be determined in consultation with the student's advisor. All students must file a Statement of Plan to Fulfill the Methodological Skills Requirement by the end of the second quarter of their first year in residency.

**Master's Examination** Students take the master's examination during the week of spring-quarter examinations of their first year. The examination is based on the material covered in the ANTH 200A, ANTH 200B, and ANTH 200C sequence and is required of all students, including those holding a master's degree from another institution. Depending on the student's performance on the test, the faculty will recommend one of the following:

1. **Pass with Distinction or High Pass** Automatic continuation in the Ph.D. program and award of the master's degree under Graduate Division Plan II.
2. **Pass** Awarding of the master's degree under Graduate Division Plan II, but a successful retake (Pass with Distinction or High Pass) is required to continue in the Ph.D. program.
3. **Fail** Master's degree not awarded, but one retake within six months is allowed for potential awarding of the master's degree under Graduate Division Plan II.

The **Preliminary Research Statement** is designed to present the research orientation for an intended dissertation topic and to explain how the student intends to develop and pursue the area of research. The statement should present a comprehensive plan of study and a timeline covering the remainder of the student's graduate career, and outline intended areas, theories, and methods. It should be considered a precursor to the materials developed later in the research proposal and the written qualifying examination. Designating a dissertation committee is part of completing the statement.

The **Written Qualifying Examination** is a research paper written during a specified two-week period. The examination question is generated by the faculty advisor in consultation with the student and the dissertation committee, and must be approved by the department before the student can begin the examination.

The **Research Proposal** prepares students to undertake dissertation research and provides, in part, the basis for the oral qualifying examination. The length and format of the proposal should be similar to that of a proposal for a major funding agency.

Students must give a **Public Oral Presentation** to the department, at the James Young Colloquium, or at a national or international meeting. This presentation is intended to provide the student with experience in presenting research papers in a public context.

The **Oral Qualifying Examination** involves a demonstration of general competence in anthropology, combined with an extended discussion of the proposed dissertation research (preparation, methodology, significance, etc.).

Once students have satisfactorily fulfilled the courses requirement (including breadth requirement), language requirement, methodological skills requirement, master's examination, preliminary research statement, written qualifying examination, research proposal, public presentation, and oral qualifying examination, they are advanced to candidacy for the Ph.D. and formally begin research for the dissertation.

**Dissertation and Final Oral Examination (Dissertation Defense)** After advancement to candidacy, students complete a dissertation representing original research within their field of specialization. Dissertations generally require a year of field research followed by an additional year of data analysis and write-up. After completing the dissertation (or a substantial portion of it), students present an oral, public defense of the dissertation.

## Master's Degree

The M.A. degree in Anthropology is normally awarded as part of the Ph.D. program, rather than as a separate degree objective.

### Plan II (Comprehensive Examination)

Candidates complete 36 units, of which at least 18 must be 200-series courses and must include the ANTH 200A, ANTH 200B, and ANTH 200C sequence, and pass a written comprehensive examination prepared by a departmental committee.

## M.A. in Anthropology and Education

The M.A. is offered in cooperation with the Graduate School of Education; see the listing under Education or inquire at either office for further information.

## M.S. Degree

**Plan I (Thesis)** Candidates must complete 56 units, of which at least 24 must be 200-series courses; courses for the area of specialization as specified by the department; and an acceptable thesis.

## Lower-Division Courses

**ANTH 001. Cultural Anthropology (4)** Lecture, 3 hours; discussion, 1 hour. Basic contributions of anthropology to the understanding of human behavior and culture and the explanation of similarities and differences among human societies. The relevance of materials drawn from tribal and peasant culture to problems of the modern world. Discussion sections stress the application of anthropological methods to research problems. Credit is awarded for only one of ANTH 001 or ANTH 001H.

**ANTH 001H. Honors Cultural Anthropology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ANTH 001. Basic contributions of anthropology to the understanding of human behavior and culture and to the explanation of similarities and differences among human societies. The relevance of materials drawn from tribal and peasant cultures to problems of the modern world. Discussion sections stress the application of anthropological methods to research problems. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ANTH 001 or ANTH 001H.

**ANTH 002. Biological Anthropology (5)** Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. A survey of past and contemporary human variation and evolution considered from the perspective of the fossil record, inferences from nonhuman primate biology and social behavior, and the forces of evolution.

**ANTH 003. World Prehistory (4)** Lecture, 3 hours; discussion, 1 hour. Examines the cultural history of humankind, from the beginning of tool-using behavior in the Old World to the rise of complex social and political systems (civilizations) in both the Old and New World.

**ANTH 004. World Civilizations (4)** Lecture, 3 hours; consultation, 1 hour. A survey of archaeological, anthropological, and historical perspectives relating to the study of the nature, origins, and development of civilizations in both the Old and New World. The history and culture of ancient Mesopotamia, Egypt, Mesoamerica (Mexico), and Peru will be emphasized.

**ANTH 005. Introduction to Archaeology (5)** Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. A general introduction to the aims and methods of archaeology, in the field and in the laboratory. Briefly surveys world prehistory as revealed by these methods.

**ANTH 006. Introduction to World Music (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of people, identity, and music making. Includes listening to music from many cultural contexts. Also covers a variety of scholarly topics in world music. Cross-listed with MUS 006.

**ANTH 010. Mysteries of the Ancient Maya (4)** Lecture, 3 hours; outside research, 3 hours. An introduction to all aspects of the ancient Maya civilization of southern Mexico and Central America. The course will explore Maya origins, political organization, agriculture, art, religion, architecture, hieroglyphic writing, and the unexplained collapse of the civilization.

**ANTH 012. Great Discoveries in Archaeology (4)** Lecture, 3 hours; extra reading and written exercises, 3 hours. Introduces the methods and goals of archaeology through examples of "great discoveries" that have altered our understanding about the past. Explores discoveries from around the world, including such well-known examples as King Tut's tomb, Pompeii, and the lost cities of the ancient Maya. Also covers lesser-known recent finds and the application of modern scientific technologies in archaeology.

**ANTH 020. Culture, Health, and Healing (4)** Lecture, 3 hours; consultation, 1 hour. Surveys health, disease, curing, and nutrition in a cross-cultural perspective. Covers how different cultural groups consider disease, health maintenance, and healing; how traditional beliefs about health and nutrition arise; and what we can and cannot learn from traditional health-seeking practices.

**ANTH 027. Art of Pre-Columbian America (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. A survey course intended to provide an up-to-date background to the ancient art of Mexico, Central America, and the Andean region of western South America. The various peoples and art of pre-Columbian America are discussed according to the three broad cultural regions of Mesoamerica, the Intermediate Area (lower Central America and northwestern South America), and the Andean area. Lectures are illustrated with slides of particular sites and important examples of pre-Columbian art. Cross-listed with AHS 027.

## Upper-Division Courses

### ANTH 100. History of Anthropological Theory (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. A survey of the history of theory in anthropology and the development of the discipline. Focuses on useful ideas from these theories and methods anthropologists have developed to study other societies.

### ANTH 101. Contemporary Anthropological Theory (4)

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Explores the core ideas in modern anthropology about culture and society. Covers basic issues of contemporary theory since the 1980s. Explores the new methodologies and application of theory to ethnography.

**ANTH 102. Anthropology of Art (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Anthropological approaches to the study of art in traditional non-Western societies. Through specific readings and case studies from four geographic regions (North America, Southeast Asia, Oceania, and West Africa), the dynamic role of art in traditional societies is illustrated. Cross-listed with AHS 102.

### ANTH 103. Introduction to Visual Anthropology (4)

Seminar, 3 hours; outside research and projects, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. An introduction to the field of visual anthropology. Examines the similarities and differences between ethnographic film, critical studies, and written ethnographies. Explores the politics of representing other cultures visually. Cross-listed with MCS 103.

**ANTH 104. Human Social Organization (4)** Lecture, 3 hours; individual consultation as needed, 1 hour. An introduction to the study of families, clans, castes, classes, bureaucracies, factions, parties and other forms of human organization. Various aspects of recruitment, social control, communication, social ranking, exchange and conflict are discussed.

### ANTH 105. Organizations as Cultural Systems (4)

Lecture, 6 hours; extra reading and written exercises, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the role of culture in the formation and management of complex bureaucratic organizations. Covers types of organizations and organizational cultures, the impact of the cultural environment, and problems posed by rapid cultural change. Offered in summer only. Cross-listed with BUS 158.

**ANTH 107. Evolution of the Capacity for Culture (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 002 or ANTH 003 or relevant preparation in psychology or biology or consent of instructor. An examination of the evolution of the biological and social capacities that have made culture the central attribute of the human species. Topics include the evolution of human diet, tool-making, the family and kinship, and language.

**ANTH 108. Anthropology of Global Media (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the global production, transmission, and consumption of mass media in diverse national and transnational contexts. Includes debates over the power of media; construction of knowledge of others; affective responses to images of violence; practices of self-representation; and the ways in which consumers accept, reject and negotiate media messages.

**ANTH 109. Women, Politics, and Social Movements: Global Perspectives (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to "Third World" women's politics. Covers women's politics from a global perspective. Although international in breadth, emphasis is placed on South Asia, sub-Saharan Africa, and the Caribbean. Cross-listed with WMST 109.

**ANTH 110. Prehistoric Agriculture (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural perspective on prehistoric agriculture as resource management, economic system, and political tool. Archaeological methods and theory of reconstructing agricultural systems and their role in prehistoric societies.

**ANTH 111. Peopling of the New World (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Consideration of the archaeological, biological, linguistic, and dating evidence documenting the nature and timing of the earliest occupation of the Western Hemisphere by human populations.

**ANTH 112. Settlement Patterns and Locational Analysis (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. An archaeological perspective on spatial behavior from architectural design to regional economic systems. Provides an introduction to a broad range of issues and analytical perspectives with an emphasis on theoretical approaches and case studies.

**ANTH 113. Ancient Households and Communities (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H; ANTH 003 or ANTH 005; or consent of instructor. Explores archaeological perspectives on households and communities. Discusses their composition, function, and meaning. Illustrates with specific cases from diverse cultural contexts. Topics include everyday life in ancient households and communities, social and economic reproduction, and long-term stability and change.

**ANTH 114A. Lithic Technology I (4)**

Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): consent of instructor and either ANTH 003 or ANTH 005. Introduction to the technology of core-and-flake stone tools. Principles of fracture, quarrying, reduction, heat treatment, core technology, and production and use of flaked stone tools in core-and-flake lithic assemblages. Assemblage formation processes and their interpretation.

**ANTH 114B. Lithic Technology II (4)**

Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ANTH 114A and consent of instructor. The technology of core-and-blade industries, ground-stone industries, and millstone industries. Percussion- and pressure-blade reduction sequences and strategies, emphasizing quarrying, initial reduction, core production, blade production, and production and use of tools from blades. Technology and production of ground-stone tools, and the quarrying of raw material and production of millstones. Assemblage formation processes and their interpretation.

**ANTH 114C. Lithic Analysis (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ANTH 114A, ANTH 114B; or consent of instructor. Characterization, analysis, and interpretation of stone tool assemblages, with emphasis on debitage.

**ANTH 115 (E-Z). Archaeological Interpretations (4)**

for hours and prerequisites, see segment descriptions. Study of the prehistory of different regions of the world. Emphasis is on the method and theory underlying archaeological investigations of the nature of people and culture and the course of human development.

**ANTH 115E. North American Prehistory (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. Interpretation of the archaeological record of North America from initial peopling of the continent to the historic period.

**ANTH 115M. Prehistory of California (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A survey of prehistoric cultures of California from the earliest settlement to the historic period.

**ANTH 115Q. Great Basin Culture History (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 and either upper-division standing or consent of instructor. Prehistory and ethnography of the Great Basin. Topics include the earliest dated archaeological Lithi-stage manifestations, regional and temporal expressions of the Western Archaic, Formative Anasazi and Fremont developments, and the Numic peoples. Emphasis will be on technology and cultural ecology.

**ANTH 115R. Archaeology of Eastern Mesoamerica (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. An introduction to Mayan archaeology intended to provide an overview of ancient Maya cultural history from the Formative period to the time of Spanish contact. During the course, particular Maya sites will be described in detail.

**ANTH 115S. Archaeology of Western Mesoamerica (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. An introduction to the archaeology and culture history in the New World nuclear area of Western Mesoamerica from the occupation of this area before 10,000 years ago to the arrival of Spanish Europeans in A.D. 1519.

**ANTH 115T. Prehistory of the Southwest (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A survey of prehistoric cultures of the American Southwest from earliest settlement to the historic period.

**ANTH 115U. Andean Prehistory (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A description of Andean culture history, emphasizing Peru, from the earliest documentation of human occupation to the Spanish conquest of the Inca. Topics include origins of food production, early ceremonial architecture, Paracas textiles, the Nasca lines, Moche iconography and ritual, and Inca architecture. Discussion of major sites and their architecture, ceramics, sculpture, and other archaeological remains.

**ANTH 115X. Ancient Oaxaca (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H; ANTH 003 or ANTH 005; or consent of instructor. Explores current understanding about ancient Zapotec, Mixtec, and neighboring cultures in Oaxaca, Mexico, the location of the earliest Mesoamerican state system and one of its earliest cities.

**ANTH 116. Dating Methods in Archaeology and Paleoanthropology (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A descriptive introduction to Quaternary physical dating methods and their application in archaeology and paleoanthropology.

**ANTH 117A. History of Old World Archaeology (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A review of the intellectual, social, and historical background to the development of prehistoric and historic archaeology of the Old World (Africa and Eurasia), including the historical context to the rise of human paleontological and paleoanthropological studies. Particular attention is given to the evolution of ideas about prehistoric and historic chronology.

**ANTH 117B. History of New World Archaeology (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A review of the intellectual, social, and historical background to the development of prehistoric and historic archaeology of the colonial and industrial New World (Western Hemisphere and Oceania). Particular attention is given to the evolution of ideas about prehistoric and historic chronology.

**ANTH 118. Origins of Cities (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 003 or ANTH 005 or consent of instructor. Explores new forms of social, economic, and political organization that developed with the advent of cities. Examines case studies of the rise of urbanism in both the Old and New Worlds to investigate how and why cities emerged and consolidated.

**ANTH 119. The Anthropology of Tourism (4)**

Lecture, 3 hours; extra reading, 1 hour; field, 1 hour; term paper, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Surveys the central problems and issues in the anthropological study of tourism. Main topics include the place of tourism in the global economy, the impact of tourism on cultural identity and culture change, environmental issues in tourism development, and tourism as a form of cross- and multicultural communication. Credit is awarded for only one of ANTH 119 or ANTH 280.

**ANTH 120. Language and Culture (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H, LING 020, upper-division standing; or consent of instructor. Covers the interrelations among language, culture, and habitual behavior; the classification of languages; and anthropological uses of linguistic evidence.

**ANTH 121. Anthropological Theories of the Arts (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Anthropological theories of the arts with emphasis on folk and traditional forms. Oral and written literature will be featured, but theories of musical, visual, and other arts will be discussed.

**ANTH 122. Economic Anthropology (4)**

Lecture, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H, ECON 001; or consent of instructor. An approach to the problem of economic development based on the perspectives furnished by anthropological investigations in the less industrialized societies.

## 90 / Programs and Courses

**ANTH 123. Linguistic Anthropology (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): LING 020, or consent of the instructor. Course will cover the application of linguistics techniques to studies of other symbolic and social fields, the analysis of semantic systems, and the use of linguistic techniques for prehistory.

**ANTH 124. Ritual and Religion (4)** Lecture, 3 hours. The elements and forms of religious belief and behavior; functions of ritual in society. Cross-cultural comparisons.

**ANTH 125. Kinship Organization (4)** Lecture, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. An introduction to theories of social organization through consideration of relationships among kin.

**ANTH 126. Southeast Asian Performance (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed both as a time-honored and as a contemporary medium for cultural production, from the courts to everyday experience. Material will be drawn from the Philippines, Malaysia, Indonesia, Thailand, Laos, Cambodia, Vietnam, Burma, Singapore, and the Southeast Asian diaspora. Cross-listed with AST 123, DNCE 123, and MUS 123.

**ANTH 127. Political Anthropology (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Examines different overt and covert means by which power and social differentiation are produced, perpetuated, and challenged in societies across the world. Studies the politics of culture, ethnicity, nationalism, and gender.

**ANTH 128. Performing Arts of Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in four major geocultural regions of Asia: Central, East, South, and Southeast. No western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with AST 128, DNCE 128, MUS 128, and THEA 176.

**ANTH 129. Human Evolutionary Ecology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Application of evolutionary ecological theory to the understanding of human social behavior and culture. Topics include foraging strategies and habitat use and cooperation and competition concerning resources in social groups.

**ANTH 130. Cross-Cultural Perspectives on Dance (4)** Lecture, 2 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Course will survey anthropological writings on dance traditions found around the world. With a view to understanding dance from a global perspective, topics covered include dance as an expression of social organization and social change, dance as religious experience, and dance as play/sport. Cross-listed with DNCE 130.

**ANTH 131. Applied Anthropology (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Applies anthropology to current issues such as community development, education, health, public administration, and conflict.

**ANTH 132. Cultural Ecology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces people's relationships to their total environment. Explores strategies for managing the environment and its resources, the effects of the environment on culture and society, the impact of human management on the ecosystem, and ways in which human groups view their surroundings.

**ANTH 133. Anthropology and International Development (4)** Lecture, 3 hours; outside research, 2 hours; written work, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Analyzes the concept of development by examining major theories and approaches in the anthropological study of international development. Focuses on the relationship between anthropology and the development industry. Topics include ethical issues in development anthropology, causes of failure and success in development interventions, and transformations in development theory and practice.

**ANTH 134. Anthropology of Resource Management (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Anthropological approaches to the study of resource use and management in cross-cultural perspective. Issues include conservation, development, sustainability, and common property management. Special attention is paid to management of plant and animal resources in foraging, farming, and fishing societies.

**ANTH 135. Nutritional Anthropology (4)** Lecture, 3 hours; consultation, 1 hour. Food and nutrition in culture; world problems of malnutrition and nutritional improvement and how anthropology can contribute to their solution; explanations of cultural foodways; development and change of human eating patterns.

**ANTH 136. Anthropological Perspectives on Gender in Southeast Asia (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the intersections of gender, power and sexuality in post-colonial Southeast Asia. Revisits early ethnographic claims of gender equality. Addresses current anthropological literature on the effects of colonialism, capitalism and globalization on gender roles and gender relations within national and transnational contexts.

**ANTH 137. Anthropology: The American Tradition (4)** Lecture, 3 hours; outside research, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduces the historical development of anthropological thought in the United States as a manifestation of class and state formation. Clarifies various intellectual currents in contemporary anthropology and their relationships to intellectual and social developments in the broader society.

**ANTH 138. Class and State Formation (4)** Lecture, 3 hours; outside research, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of the dynamics of class and state formation. Explores the consolidation of class structures and state institutions and practices in the context of kin/civil conflict, the distortion and dissolution of nonexploitative social relations, and the constitution of gender, ethnic, and racial hierarchies. Considers ethnogenesis and the construction of state and mass cultures.

**ANTH 139. Change and Development (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 003 or ANTH 005; upper-division standing or consent of instructor. Examines alternative theories of society, change, and development, as well as the assumptions and premises on which they are based. Considers how they are used to explain capitalist development, imperialism, colonial encounters, nationalism, decolonization, socialist revolution, modernization, unequal exchange, uneven development, globalization, and postcolonialism.

**ANTH 140 (E-Z). Ethnographic Interpretations (4)** for hours and prerequisites, see segment descriptions. Study of peoples and cultures in particular areas of the world. Emphasis is placed on ethnological and theoretical problems as these are revealed in the examination of the history, coherent sociocultural patterns, and ecology of specific aboriginal populations and contemporary groups.

**ANTH 140E. Ethnology of the Greater Southwest (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the many varied native cultures of the Greater Southwest. Major differences as well as similarities in the forms of language, social organization, religion, and material culture occurring in the Greater Southwest will be defined and described. The peoples of the Greater Southwest are considered, not only in terms of the ethnographic present, but also through a diachronic perspective, from the prehistoric past through the Spanish colonial era to the present.

**ANTH 140F. California Indian Peoples (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A survey of the life-ways of Indian peoples of California at the time of Euro-American contact, the history and effects of contact, and contemporary conditions.

**ANTH 140G. Anthropological Perspectives in Africa (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A number of African cultures are carefully examined in terms of three or four anthropological topics, such as: subsistence patterns, social organization, and religious systems. The treatment of these cultures follows a brief overview of the geography, history, and linguistic patterns of Africa.

**ANTH 140-I. Cultures of Southeast Asia (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or equivalent. Anthropological interpretations of culture and society in southeast Asia, including Indonesia; topics include prehistory, ethnic groups, social organization and structure, human ecology, folk and high culture, etc.

**ANTH 140J. The Andes, Past and Present (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H, upper-division standing; or consent of instructor. Provides an overview of Andean society, past and present. Examines the colonial matrix in which Iberian and Andean social, political, and cultural forms came together. Uses ethnographies, indigenous narratives, and film about contemporary Andean society to address issues of class, ethnicity, gender, and the politics of representation.

**ANTH 140-O. An Anthropology of Mexicans of the Southwest United States (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Familiarizes students with the content and process of "U.S. Mexican Cultures." Stresses the manner in which Mexican populations have long survived the stresses and strains of transmigration, cultural "bumping," human adaptation, and creating viable cultural systems of survival and expression largely within the U.S. Southwest.

**ANTH 140P. Cultures of the Pacific (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Overview of the cultures and contemporary issues facing the people of Melanesia, Micronesia, and Polynesia. Examines the contribution of Oceanic studies to anthropological theories of kinship and exchange, gender, development studies, and indigenous knowledge systems. Emphasizes how Pacific Islanders draw on their cultural heritage in emerging from formal colonialism to establish new island nations.

**ANTH 140S. The Peoples of Mexico in Historical and Global Perspective (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the cultures and societies of Mexico in historical and global perspective. Emphasis on agrarian communities and the contributions of Mesoamerican ethnography to general anthropological theory.

**ANTH 140T. Agriculture and Rural Society in Mexico: Past and Present (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The evolution of rural Mexico: from origins of Mesoamerican agriculture to the rise of high civilizations; from the establishment of the colonial system to the demise of colonial agricultural institutions; from the revolution of 1910 to the enactment of land reform and development programs. The role of peasantry in the making of the modern state is emphasized.

**ANTH 141. Database Design for Anthropology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing in Anthropology; consent of instructor. A study of the skills necessary for design and development of databases for anthropological and archaeological data. Covers assessing requirements for, planning, designing, and constructing databases that are easily connected to and used by database management and geographic information systems software.

**ANTH 142. Geographic Information Systems (GIS) Software for Anthropology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing in Anthropology; consent of instructor. Provides students with a focused background in geographic information systems (GIS) theory and practical software applications for anthropology. Addresses spatial ontological concepts and showcases how they have been applied to anthropological issues around the world. Includes hands-on experience in the use of GIS and related software.

**ANTH 143. Gender, Race, and Medicine (4)** Lecture, 3 hours; written work, 1 hour; extra reading, 1 hour; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the relationship between Western medicine and women, racial minorities, and non-Western citizens. Investigates how gender ideology, racial inequity, and colonialism shape the medical representation of bodies, sexuality, and pathology. Examines how patients have renegotiated their relationships with medicine through health movements and alternative healing practices. Cross-listed with WMST 185.

**ANTH 144. Hunters and Gatherers (4)** Lecture, 3 hours; consultation, 1 hour. An overview of hunter-gatherer cultures including a survey of selected ethnographic cases with special emphasis on the relevance of the hunting-gathering way for anthropological theory. Topics will include: subsistence strategies, the organization of bands, and models for prehistoric populations.

**ANTH 145. Sexualities and Culture (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): WMST 001 or consent of instructor. Examines the field of sexuality studies using a comparative, cross-cultural approach. Emphasizes the relation between culture, history, and political economy in the emergence of sexual practices and sexualized identities. Examines theories of sexuality and identity, with particular attention to violence, human rights, and political agency. Cross-listed with WMST 103.

**ANTH 146. Primate Social Behavior (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 002 or PSYC 002. Considers social organization and behavior in monkeys and apes, with emphasis on the adaptive aspects of social patterns and the relevance of primate studies to human evolution. Cross-listed with PSYC 146.

**ANTH 147. Reproduction: Policies, Politics, and Practices (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing.

Examines reproductive policies, politics, and practices from a cross-cultural and historical perspective. Discusses political and economic processes and socio-cultural dynamics, population control, sex preference, infanticide and neonatal neglect, adoption and foster parenting, abortion, technologically assisted conception, and gestational surrogacy. Cross-listed with WMST 140.

**ANTH 148. Gender and the State (4)** Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the various meanings of gender as it is articulated in, reproduced by, and shaped within the state. Discusses gender-state relations, the engendering of politics, state functions, policy, and politics in various historical, political, cultural, and social contexts. Cross-listed with WMST 150.

**ANTH 149. Gender, Kinship, and Social Change (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): WMST 001. Examines theories of gender and kinship, the formulation of gender hierarchies and their uneven development, and the dynamics of "family" and gender in stratified social formations. Analyzes the relationship between family forms and political and economic processes. Cross-listed with WMST 149.

**ANTH 150. Human Microevolution (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): ANTH 002; relevant preparation in the life sciences; or consent of instructor. Covers methods of classical and population genetics applied to the understanding of evolution and variation in contemporary human populations.

**ANTH 152. Evolution of the First Hominids (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 002 or consent of instructor. Explores human evolution in the first five million years; examines the fossil record and incorporates data from archaeology and genetics. Topics include hominoid evolution in the Miocene, origin models of the human lineage, and the first ancestral humans.

**ANTH 153. Evolution of the Genus Homo (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 002 or consent of instructor. Explores human evolution in the last two million years; examines the fossil record and incorporates data from archaeology and genetics. Topics include origins of genus *Homo*, world-wide dispersals, Neandertals, and origins of modern humans.

**ANTH 154. Research Methods in Biological Anthropology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 002 or consent of instructor. Introduces quantitative research methods in biological anthropology. Topics include the history of scientific approach in American anthropology, statistics, data resampling, evolution, and variation.

**ANTH 155. Human Osteology (4)** Lecture, 2 hours; discussion, 1 hour; outside research, 3 hours. Prerequisite(s): consent of instructor. An in-depth study of the human skeleton, including bone biology, functional morphology, fragment identification, reconstruction, forensic methods, and curation techniques. Useful for anthropologists and those intending careers in medicine, physical therapy, and forensics.

**ANTH 156. Advanced Osteology (4)** Lecture, 2 hours; discussion, 1 hour; outside research, 3 hours. Prerequisite(s): ANTH 155 or consent of instructor. Further study of the human skeleton, emphasizing applications in anthropological contexts and preparation for professional careers in archaeology, forensics, and paleontology.

**ANTH 158. Biological Approaches to Medical Anthropology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 002 or consent of instructor. Introduces medical anthropology from the biological perspective. Explores topics on evolution, health, and medicine; human biological variation in relation to disease; bioarchaeology; and the history of health. Takes the integrative and multidisciplinary approach.

**ANTH 159. Demographic Anthropology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 002 or ANTH 003 or ANTH 005 or consent of instructor. Applies demographic theory and methods to problems in cultural, archaeological, and biological anthropology.

**ANTH 160. Political Economy of Health (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines critical medical anthropology. Focuses on the linkages between political economy, health, and healthcare systems in modern societies. Considers the effects of poverty, occupation, and environmental transformation in particular social contexts. Looks at four case studies: the political economy of HIV/AIDS, poverty, famine, and nuclear regulation.

**ANTH 161. Indigenous People and the State in Latin America (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Reviews the historical processes and regional circumstances that have governed relations between indigenous peoples and Latin American states. Studies concepts of nationalism, ethnicity, and the state in the context of indigenous efforts to resist assimilation and to gain limited autonomy. Compares with the problems and prospects of multiethnic societies worldwide. Cross-listed with LNST 161.

**ANTH 162. Culture and Medicine (4)** Lecture, 3 hours; consultation, 1 hour. Interrelations of health, disease and culture; cross-cultural comparisons of "health," "disease" and "curing" concepts; effects of cultural behavior on health and illness. Special focus on traditional societies and their belief systems, and on the effects of cultural change (historical and modern) on illness and curing.

**ANTH 163. Transnational and Global Communities (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical survey of recent anthropological and related research and theory concerning transnational and global sociocultural processes. Special emphasis on transnational, diasporan, and other unbounded communities; borderlands; and the impact of global media and communication and transnational migration on community and identity.

**ANTH 164. Gender and Development in Latin America (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Discusses the role and contribution of Latin American and Caribbean women within their societies. The effects of national economic development policies upon their status and their participation in and integration into the policy-making process are emphasized. Cross-listed with LNST 164 and WMST 164.

**ANTH 165. Cognitive Anthropology (4)** Lecture, 3 hours; consultation, 1 hour. The structure of the knowledge of cultural domains; systems of knowledge in different cultures examined in the light of theories of how people learn them, store them, and use them.

**ANTH 166. Cultural Perspectives of Cancer (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Examines how cancer has been perceived and described by biomedical and public health practitioners, anthropologists, and social scientists. Interdisciplinary approach focuses on the historical, political, and cultural dimensions that inform our understanding of cancer in particular and disease in general. Topics include illness narratives, risk, epidemiology, and unequal disease distribution and treatment.

**ANTH 167. Structural/Descriptive Linguistics (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): LING 020 or consent of instructor. An overview, from the original sources, of the contribution of major figures and schools in linguistics from Saussure through early Chomsky. Cross-listed with LING 167.

**ANTH 168. Caribbean Culture and Society (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of the Caribbean region from a historical, cultural, and political perspective. Emphasis on contemporary issues affecting the Caribbean, and the struggle of its people to maintain their identities. Cross-listed with ETST 148 and LNST 168.

**ANTH 169. From the Maghreb to the Middle East (4)** Lecture, 3 hours; written work, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or GBST 001 or GBST 002 or consent of instructor. An introduction to the peoples and societies of North Africa and the Middle East. Follows the travels of Ibn Battutah, Ibn Khaldun, and Rafik al Tahtawi. Topics include religion, migration, gender, political organization, the global Middle East, Orientalism, and cultural production. Cross-listed with GBST 169.

**ANTH 170. Ethnobotany (4)** Lecture, 2 hours; seminar, 1 hour; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104, or consent of instructor. Introduces students to ethnobotanical research by reviewing selected ethnobotanical studies. Topics covered by lectures include fundamental principles of ethnobotany, the search for new medicines and other products made from plants, the role of humans in plant evolution, and the impact of plants on human cultures. Discussions focus on the past and present role of humans in plant conservation and the search for sustainable management practices in agriculture and forestry. Seminars by invited guests and enrolled students present selected topics in ethnobotany. Cross-listed with BPSC 170.

**ANTH 171. Field Course in Maya Archaeology (4-12)** Lecture, 2 hours; laboratory, 3-6 hours; field, 3-24 hours. Prerequisite(s): either ANTH 003 or ANTH 005 and consent of instructor. Archaeological surveying and excavation, including training in site mapping, use of satellite-based Global Positioning Systems, natural resources surveying, and field laboratory techniques.

**ANTH 172. Archaeological Theory and Method (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A historical survey of conceptual and methodological approaches to understanding the archaeological record. Topics include a priori assumptions, unit concepts, goals, models, and research strategy.

**ANTH 173. Social Meanings of Space (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the range of meanings attached to spaces and places, from small-scale expressions such as houses to larger ones such as cities and landscapes. Explores how spaces can reflect and foster social conflict or social unity. Through a study of diverse cultural traditions, considers both the architecture and occupied but "unbuilt" spaces in ancient and current societies.

**ANTH 174. Anthropology and Film (4)** Lecture, 3 hours; extra reading, 30 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Explores the history of anthropological representations of culture through film and the debates over the production of ethnographic knowledge. Examines shifts in film from a product of ethnographic research to an object of anthropological inquiry. Studies include horror, war, ethnographic, and indigenous films in relation to race, class, gender, sexuality, and nationhood.

**ANTH 175A. Anthropological Research: Basic Techniques (4)** Lecture, 3 hours; consultation, 1 hour. Includes basic data gathering procedures in anthropological field work such as censuses, maps, surveys and genealogies.

**ANTH 175B. Anthropological Research: Specialized Techniques (4)** Lecture, 3 hours. Includes ethnographic field techniques such as the aggregation of open-ended data, frame elicitation, componential analysis, collection of quantitative data, behavioral observation, and social-cultural inferences from geographical and spatial distributions.

**ANTH 176. Music Cultures of Southeast Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with AST 127, DNCE 127, ETST 172, and MUS 127.

**ANTH 177. Gender, Sexuality, and Music in Cross-Cultural Perspectives (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of gendered performance genres from a number of cultures. Seeks to familiarize the student with gender-specific music and notions of gender that are often constructed, maintained, transmitted, and transformed through music and performance. Designed for students interested in music, anthropology, and gender studies. Cross-listed with MUS 126 and WMST 126.

**ANTH 178. Gender and Archaeology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 005 or WMST 001 or consent of instructor. Considers gender roles in ancient and historically recent human societies, as well as how gender has shaped archaeological investigation. Cross-listed with WMST 178.

**ANTH 179. Gender, War, and Militarism (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines politics of militarization in relation to gender, race, and sexuality in national and international contexts of war. Explores ideologies and representations of masculinity and femininity in discourses of militarism. Topics include war crimes; contestations over historical memory; effects of militarization on gender roles; cults of heroism; and peace activism.

**ANTH 180A. Introduction to Anthropological Methods and Techniques (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H; ANTH 003 or ANTH 005; a major or minor in Anthropology; or consent of instructor. Strongly recommended for anthropology majors and minors. Surveys methods and techniques utilized in archaeology, cultural anthropology, and physical anthropology. Explores the epistemology of scientific discourse; debates in ethnography, linguistics, and processual and poststructural archaeology; and techniques in physical anthropology, with an emphasis on demographic, epidemiological, and genetic analysis.

**ANTH 180B. Research Methods and Techniques in Cultural Anthropology (4)** Lecture, 3 hours; fieldwork, 30 hours per quarter. Prerequisite(s): ANTH 180A or consent of instructor. Strongly recommended for anthropology majors and minors. Develops the most important methods in cultural anthropology including research design, participant observation, informant selection, organization of field notes, household and community questionnaires, structured and unstructured interviews, oral and life histories, archival research and secondary data, and coding and analysis of qualitative data.

**ANTH 180C. Anthropological Field Research (4)** Lecture, 2 hours; outside research, 6 hours. Prerequisite(s): ANTH 180A; ANTH 180B or ANTH 183 or ANTH 184 or ANTH 185; or consent of instructor. Introduces students to the process and problems of conducting field research in the local region. Topics include construction of research problems, research design, research implementation, preparation of human subject protocols, strategies of data collection and analysis, and report preparation.

**ANTH 181. Political Economy of South Africa (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Examines contemporary societies of southern Africa. Focuses on changes and continuities since the end of apartheid. Topics include transformations in ethnic and racial identity and classification; postapartheid class formation and neoliberalism; labor migration and immigration; HIV/AIDS; land reform, resettlement, and spatial transformation; tourism; and conservation.

**ANTH 182. Anthropology of Human Rights (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines debates in the study of human rights and social injustice. Uses case studies in Asia, Africa, and Latin America to explore legal, cultural, and political practices and representations of rights and reconciliation in postconflict settings. Includes globalization of rights; cultural relativism; indigenous rights movements; advocacy; and gender and health rights.

**ANTH 183. Methods of Archaeological Analysis (4)** Lecture, 2 hours; laboratory, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. Description and classification of archaeological materials including laboratory work in cataloging and documentation, methods used in artifact typology and seriation, and the preparation of reports for publication.

**ANTH 184. Field Course in Anthropology (4-16)** field research, variable. Prerequisite(s): ANTH 175A or consent of the instructor. Study with a qualified professional at selected research sites with on-site supervision. Normally, 16 units will be assigned only when the student is engaged in full-time research at a site distant from UC Riverside. Course may be repeated for credit for up to three quarters with consent of the instructor and approval of a research plan by the department chair.

**ANTH 185. Field Course in Archaeology: Survey and Documentation (4)** Lecture, 1 hour; discussion, 1 hour; field, 6 hours. Prerequisite(s): ANTH 003 or ANTH 005; upper-division standing; consent of instructor. Trains students in field surveying and documenting historic and aboriginal archaeological sites. Covers satellite-assisted electronic location, cadastral survey location, Universal Transverse Mercator grid coordinates, field mapping, recording environmental parameters, characterizing assemblage, assessing significance, and using archaeological information centers.

**ANTH 186. People and the Environment in Latin America (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An interdisciplinary course focusing on the study of the relation between human communities and the environment in Latin America. Examines environmental problems and policies. Cross-listed with LNST 166.

**ANTH 187. Anthropology of Risk (4)** Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; term paper, 10 hours per quarter. Prerequisite(s): ANTH 001 or ANTH 001H; upper-division standing; or consent of instructor. Examines theoretical and ethnographic works related to the perception of risk. Focuses on a range of arguments that view risk as an objective hazard, a symbolic construction, or as historically, politically, and socially contingent. Topics include law, health, pollution, and migration.

**ANTH 190. Special Studies (1-5)** Prerequisite(s): consent of instructor. Independent study and research by qualified undergraduate students under supervision of a particular faculty member. With consent of instructor, may be repeated without duplication of credit.

**ANTH 191. Seminar in Anthropology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines contemporary issues and topics in anthropology that are not part of the regular curricular offerings. Content of the course varies and is announced as the course is offered. Course is repeatable to a maximum of 16 units.

**ANTH 195A. Senior Thesis (4)** Optional for anthropology majors; open to senior students having a "B" average in their major, with consent of instructor. Graded In Progress (IP) until ANTH 195A, ANTH 195B, and ANTH 195C are completed, at which time a final grade is assigned.

**ANTH 195B. Senior Thesis (4)** Optional for anthropology majors; open to senior students having a "B" average in their major, with consent of instructor. Graded In Progress (IP) until ANTH 195A, ANTH 195B, and ANTH 195C are completed, at which time a final grade is assigned.

**ANTH 195C. Senior Thesis (4)** Optional for anthropology majors; open to senior students having a "B" average in their major, with consent of instructor.

**ANTH 198-I. Internship in Anthropology (1-12)** field research, 1-16 hours. Prerequisite(s): consent of instructor. Systematic participation by an individual in studies associated with future career(s) development within the context of an anthropological research project directed by a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units towards graduation.

**ANTH 199H. Senior Honors Research (1-5)** research, variable. Independent work under the direction of members of the staff. With consent of instructor, may be repeated without duplication of credit.

## Graduate Courses

**ANTH 200A. Core Theory in Anthropology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing in Anthropology or consent of instructor. Examines the foundational theories of anthropology and how these inform current discussions about human origins, the origins of human society, the transformation of nature, work, and the built environment.

**ANTH 200B. Core Theory in Anthropology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing, ANTH 200A; or consent of instructor. Examines the foundational theories of anthropology and how these inform current discussions about diversity; the origins of inequality; language; power; knowledge systems; and the politics of representation.

**ANTH 200C. Core Theory in Anthropology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing, ANTH 200A, ANTH 200B; or consent of instructor. Examines the foundational theories of anthropology and how these inform current discussions about aesthetics, history, capitalism, imperialism, decolonization, globalization, transnationalism, cultural politics, violence, and human rights.

**ANTH 203. Southeast Asian Cultures (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys ethnographic literature on Southeast Asian cultures, with an emphasis on contemporary research. Covers anthropological approaches to the study of text, ritual, and performance practices; intercultural dynamics; the impact of colonialism and nationalism on traditional cultures; and globalization. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with SEAS 203.

**ANTH 209. Field Course in Maya Archaeology (4-12)** Lecture, 2 hours; laboratory, 3-6 hours; outside research, 0-3 hours; field, 3-21 hours. Prerequisite(s): graduate standing and consent of instructor. Archaeological survey and excavation, including training in: site mapping; use of satellite-based Global Positioning Systems; natural resources surveying; and field laboratory techniques. Course is repeatable to a maximum of 36 units with consent of instructor and approval of a research plan by the department chair.

**ANTH 210A. Description and Inference in Anthropology (4)** Seminar, 3 hours; outside research, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An examination of the modes of defining concepts and relations, developing and framing theories, and relating data to theory in anthropology; analysis of representative attempts to describe and explain behavior; and practice in carrying out simple analyses.

**ANTH 210B. Professionalism in Anthropology (4)** Seminar, 3 hours; outside research, 1 hour; extra reading, 1 hour; proposal preparation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers many aspects of professional career development in anthropology (including archaeology). Topics include the establishment of career goals, building a professional reputation, presenting papers at meetings, submitting manuscripts for publication, developing a research proposal, identifying sources of research funding, and the job search.

**ANTH 218. Ancient Maya History and Religion (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Along with describing major historical figures and religious concepts of the ancient Maya, this course describes the analytic approaches used for the study of ancient Maya writing and art. The pioneering work of the nineteenth century as well as the most recent findings in the ongoing process of decipherment and iconographic interpretation will be discussed. Basic background needed to begin original research and interpretation will be provided.

**ANTH 220. Theoretical Archaeology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the foundational theories of archaeology, the underlying networks of assumptions, and contemporary theoretical developments in the field.

**ANTH 250A. Seminar in History and Theory of Anthropology: Beginnings (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Systematic and historical treatment of the people, concepts, and research that have contributed to the development of anthropology. Covers the early history of anthropology, up to the rise of structural-functionalism.

**ANTH 250B. Seminar in History and Theory of Anthropology: 1920-1970 (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Systematic and historical treatment of the people, concepts, and research that have contributed to the development of anthropology. Covers the period in which much of anthropology was dominated by structural-functionalism, structuralism, and related approaches.

**ANTH 250C. Seminar in History and Theory of Anthropology: 1970 to Contemporary Times (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Systematic and historical treatment of the people, concepts, and research that have contributed to the development of anthropology. Surveys contemporary theories in anthropology, especially new ones that have arisen as antitheses to structural and processual models.

**ANTH 251. Theory and Method in Mexican Ethnography (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the basic issues of theory and method in Mexican ethnography. Major streams of thought framing the substance and approaches of rural and urban ethnographies of Mexico are examined.

**ANTH 252. Seminar in Archaeology (4)** Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies in culture history and in the data and methods of archaeological research. Course is repeatable as topics change.

**ANTH 253. Seminar in Physical Anthropology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the analysis of human variation and evolution, the structure of human populations, and the biocultural environments of humans. Course is repeatable as topics change.

**ANTH 255. Feminism, Gender, and Archaeology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers feminist perspectives on past human societies, as well as how feminism and gender have shaped archaeological research design. Examines how gender relates to careers in archaeology.

**ANTH 256. Seminar in Cultural Anthropology (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides focused coverage of concepts, theory, and methods central to various subfields in cultural anthropology. Course is repeatable as topics change.

**ANTH 258. Space and Place in Archaeology (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines concepts of space and place in archaeology. Explores how spaces can reflect and foster social conflict or unity through studies of diverse cultural traditions. Considers both the architecture and occupied but unbuild spaces in ancient and current societies.

**ANTH 259. Seminar in Anthropological Linguistics (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies in the concepts, methods, and data pertinent to anthropological linguistics.

**ANTH 260. Ethnographic Field Methods (4)** Seminar, 3 hours; field, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces ethnographic field methodologies and research techniques through theoretical and practical application. Examines historical and contemporary models of fieldwork practices and ethics. Topics include fieldwork preparation; participant observation; ethnographic responsibilities; data collection techniques; interviews; gendered dynamics of field research; historical and visual methods; and violence in the field. Course is repeatable.

**ANTH 261. Anthropology of the Body (4)** Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines cultural anthropology's treatment of the body as both a subject and object of social processes through recent and classic texts. Aims to ground theoretical inquiry in ethnographic and historical materials through the examination of bodies across time and space.

**ANTH 262. Seminar in Medical Anthropology (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys major topics in medical anthropology. Examines the theoretical and methodological underpinnings of medical anthropology, including the cultural construction of health and disease, the nature of the therapeutic process, and how social structures contribute to inequality and suffering.

**ANTH 263. Seminar in Ecological Anthropology (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in method and theory of ecological anthropology, including ethnobiology, food production and consumption, development issues, views of the environment, and questions about the relationship of humans to their environments.

**ANTH 264. Codices of Ancient Mexico (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The major manuscripts of the pre-Hispanic and contact periods of Mesoamerica will be reviewed. Special focus will be on the ancient codices of the Maya, Aztec, Mixtec, and the unprovenanced Borgia Group.

**ANTH 265. Seminar on Anthropology of Visual Culture (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Presents a historical and ethnographic overview of the role of visual culture in the production and transmission of scientific and cultural knowledge. Focuses on the politics of representation and the ways in which images have maintained or challenged racial, gender, and global hierarchies and inequalities.

**ANTH 266. Seminar on History and Memory (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores how societies remember, forget, and give meaning to the past through diverse forms of expression in national and transnational contexts. Examines contestations over historical representations and narrations, as well as the ways in which history and memory are shaped and contested by competing claims to power, legitimacy, and authenticity.

**ANTH 267. Ethnographies of Postsocialism (4)**

Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores diverse sociocultural, economic and political experiences of socialist-capitalist transformations. Includes late and postsocialist nation states in Eastern Europe and postcolonial Asia, Latin America, and Africa. Examines the revival of socialist political and cultural projects as a response to capitalist globalization and escalating social and economic inequalities.

**ANTH 277. Seminar in Political Ecology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An advanced course focusing on the relationship between political economy and human ecology for the analysis of the interaction between people, natural resources, and the environment.

**ANTH 278. Seminar in Representation and the Ethnographic Text (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Critically reviews and analyzes ethnographic texts, both traditional and experimental. Examining ethnographies as a form of writing, the seminar explores the larger intellectual, theoretical, and political context in which production of ethnographies occurs.

**ANTH 279. Seminar in Political Anthropology (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviewing different forms of stratification and power in society, this seminar critically reviews and analyzes a broad range of materials, debates, and contemporary trends within political anthropology.

**ANTH 280. Seminar in Anthropology of Tourism (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An anthropological study of travel and tourism. Topics include cultural implications for travelers, local people, environment, and economy; historical and social construction of tourist sites; material objects; the culture and performance of tourism; the photographic eye; the tourist encounter; cultural mediation; politics of cultural representation; and commoditization of culture. Credit is awarded for only one of ANTH 119 or ANTH 280.

**ANTH 290. Directed Studies (1-6)** Independent study by graduate students under supervision of a particular faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ANTH 291. Individual Studies in Coordinated Areas (1-6)** Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for doctoral examination. The following rules apply: 1) a student may take up to 12 units for the Basic Requirements; 2) a student may take up to 8 units for the Comprehensive Requirements. Graded Satisfactory (S) or No Credit (NC).

**ANTH 292. Concurrent Analytical Studies in Anthropology (1-4)**

Each ANTH 292 course will be taken concurrently with some 100-series course, but on an individual basis. It will be devoted to completion of a graduate paper based on research or criticism

related to the 100-series course. Faculty guidance and evaluation will be provided throughout the quarter. Satisfactory (S) or No Credit (NC) grading is not available. May be repeated with different topic.

**ANTH 297. Directed Research (1-6)** Individual research by graduate students directed by a particular faculty member. Graded Satisfactory (S) or No Credit (NC).

**ANTH 299. Research for Thesis or Dissertation (1-12)**

Field training and directed research in preparation for and completion of doctoral dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

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**ANTH 301. Directed Studies in the Teaching of Anthropology (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Discusses bibliography and research and teaching techniques used in the instruction of anthropology. Covers how to lead discussion sections and relate student experience to anthropological problems. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ANTH 302. Teaching Practicum (1-4)**

Prerequisite(s): limited to departmental teaching assistants; graduate standing, ANTH 301, or consent of instructor. Supervised teaching in upper- and lower- division Anthropology courses. Required of all teaching assistants. Fulfills teaching portion of Ph.D. teaching requirement. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

## Art

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**Subject abbreviation: ART**  
**College of Humanities, Arts, and Social Sciences**

Charles Long, M.F.A., Chair  
 Department Office, 232 Arts  
 (951) 827-4634; [art.ucr.edu](mailto:art.ucr.edu)

**Professors**

John M. Divola, M.F.A., *Distinguished Professor*  
 Jill Giegerich, M.F.A.  
 Jonathan W. Green, M.A. (Art/Art History)  
 Jim Isermann, M.F.A.  
 Charles Long, M.F.A.  
 Erika Suderburg, M.F.A.

**Professor Emeritus**

Uta Barth, M.F.A.  
 James S. Strombotne, M.F.A.

**Associate Professors**

Brandon Lattu, M.F.A.  
 Amir Zaki, M.F.A.

**Assistant Professor**

Melissa Thorne, M.F.A.

## Major

The Department of Art offers a B.A. degree in an interdisciplinary program that emphasizes a critical approach to artistic production. Courses are offered in the following curricular areas: photography, digital art, video, two- and three-dimensional media (painting, drawing, sculpture, installation), and critical theory. The program is designed primarily for students preparing for graduate study and those who plan to continue professionally as artists. However, the department welcomes the participation of non-majors and nondegree students.

Admission to the Major in Art requires electronic submission of a portfolio consisting of ten (10) images of your original work and/or three (3) clips of moving images or sound work. Guidelines for the portfolio and a link to the site for submission can be found on the art department website at <http://www.art.ucr.edu/>.

Students whose portfolios are approved will be admitted to the major. Guidelines for submission are also available from Undergraduate Admissions and from the Department of Art.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. in Art are as follows:

1. Lower-division requirements (28/30 units)
  - a) ART 006/MCS 006
  - b) Four additional lower-division Art courses: ART 001, ART 002, ART 003, ART 004/MCS 004, ART 005, ART 009, ART 065, ART 066/CS 066.
  - c) Two of the following courses: AHS 008, AHS 017A, AHS 017B, AHS 017C, AHS 020/MCS 023, or AHS 021/URST 021, AHS 023, PHIL 001, PHIL 007 (courses may be used to satisfy breadth requirements).
2. Upper-division requirements (36/37 units)
  - a) ART 160
  - b) One of the following Art History courses: AHS 115, AHS 135, AHS 136/MCS 137, AHS 175, AHS 176/MCS 176, AHS 178, AHS 179, AHS 180, AHS 181, AHS 182, AHS 184/URST 184, AHS 185/URST 185, AHS 186, AHS 187, AHS 188, AHS 189E-Z or any other upper-division Art History course that covers the period 1945 to present
  - c) ART 180
  - d) A minimum of 20 additional units of upper-division Art course work
  - e) ART 133 Art Workshop (must pass with C+ or better.)

**Note** A maximum of 12 upper-division transfer units of established equivalency in Art courses is accepted for credit. Equivalent transfer units in lower-division studio art course work and lower- and upper-division Art History course work is also accepted for credit toward the major in the respective lower- or upper-division category.

A minimum of 36 units of Art must be taken in residence (UCR Department of Art) to fulfill this major.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

The Art Department offers the Master of Fine Arts (M.F.A.) degree in Visual Art.

### Master of Fine Arts in Visual Art

The program's primary goal is to provide a context for research and production of contemporary art at the highest level. The M.F.A. in Visual Art is interdisciplinary, and students can draw on the resources of other departments on campus, including the UCR/California Museum of Photography.

The program emphasizes digital imaging, photography, and video, but students are free to work in any medium. The core of the program is independent creative work done in consultation with faculty. Creative work can be digital imaging, film or video works, installations, painting, performances, photography, sculpture, or any visual medium.

**Admission** Applicants must have a B.A. or B.F.A. degree. They must submit an application including all required support documents, a portfolio of their work, and three letters of recommendation. The GRE is not required. Students without any visual arts background may be required to complete courses in Studio Art and Art History subsequent to admission.

**Plan I (Thesis)** The M.F.A. is a Plan I (thesis) master's degree program, requiring 72 units in graduate or approved upper-division undergraduate courses that must be completed with at least a letter grade of "B" or "Satisfactory."

Required courses include 48 units in graduate courses in theory and criticism, as well as individual projects and tutorials:

1. Three courses of ART 285, Graduate Critique
2. ART 230, Contemporary Critical Issues
3. ART 240, Critical Theory
4. ART 299, Research for Thesis
5. Art History Graduate Seminar
6. Five courses of ART 290, Individual Tutorial

Of the remaining 24 units in elective courses, at least one additional course must be in Art History or Media and Cultural Studies, and at least two additional courses must be taken from

a department other than art. These courses may be graduate or undergraduate courses.

MFA students receive a degree in Visual Art. The course of field study is not characterized by medium.

Students participate on yearly reviews during the Winter quarters of their first and second year.

The thesis requirement is met by the student's M.F.A. thesis exhibition, accompanied by a written thesis on the work exhibited. A graduate thesis committee reviews the thesis. The committee is composed of four faculty members, at least three from the Department of Art. The fourth faculty member may be from another department at any UC Campus. Persons who are not UC Senate members may be appointed only with the approval of the Graduate Dean. Nominations that require this approval should be forwarded to the Graduate Division by the end of the student's second year.

**Foreign Language Requirement** None

**Teaching Requirement** None; however, students are given opportunities to teach and are encouraged to do so.

**Normative Time to Degree** Nine quarters

## Lower-Division Courses

**ART 001. Beginning Drawing and Design (4)** Lecture, 2 hours; studio, 4 hours. Introduction to the materials, techniques, structure and expressive properties of drawing and design. Includes lectures, studio exercises and outside assignments.

**ART 002. Beginning Painting and Design (4)** Lecture, 2 hours; studio, 4 hours. Introductory course in the media, techniques, structural and expressive properties of painting and design. Includes lectures, studio exercises and outside assignments.

**ART 003. Introduction to Photographic Processes (5)** Lecture, 3 hours; studio, 4 hours. Introduction to the basic principles of photography as fine art. Focuses on technological and conceptual evolution from analog to digital practice. Addresses a range of technological approaches to photography from traditional analog processes to digital image capture, organization/archiving, and printing. Explores historical and contemporary approaches to creating meaningful photographs.

**ART 004. Introduction to Video Art (5)** Lecture, 3 hours; studio, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to video as an art form based in production and contemporary media theory. Covers basic production techniques, operation of the camcorder, and the fundamentals of live-action production and editing. Examines documentary, experimental, and other applications of the media arts in relation to contemporary art practice, installation, and performance. Cross-listed with MCS 004.

**ART 005. Beginning Sculpture and Three-Dimensional Design (4)** Lecture, 3 hours; studio, 3 hours.

Prerequisite(s): none. Introduction to the basic skills required to make three-dimensional and sculptural objects. Covers concept building, planning, design, brainstorming, materials, techniques, and basic contemporary sculpture history and theory. Lectures address work of contemporary artists and contemporary concepts of three-dimensional design. Studio assignments introduce new concepts and materials. Equipment is provided.

**ART 006. Introduction to Contemporary Critical Issues in Art (4)**

Lecture, 3 hours; discussion, 1 hour. Examines basic principles and methodologies of theory as applied to the interpretation and creation of works of art. Includes screenings. Cross-listed with MCS 006.

**ART 008. Current Topics in Contemporary Art (4)**

Lecture, 3 hours; activity, 3 hours. Examines visual arts as contemporary phenomenon. Includes study of recent exhibitions of contemporary art, the way art is culturally distributed, and the ideological and conceptual dialogue surrounding significant contemporary art. Encourages visits to nearby museums and major art galleries.

**ART 009. Introductory Web-Based Art: Site Creation and Navigation (4) F**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. An introduction to the technology and critical issues of Web-based art. Covers Web-site creation software and conceptual and creative navigation. Emphasis is on contemporary issues of non-object, byte-based art practice.

**ART 028. From Hamlet to Babylon 5: Introduction to Design in Film, Television, and Theatre (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the design process for film, television, and theatre. Addresses the influence design has on the viewer, as well as how looks are achieved in different media. Cross-listed with THEA 038.

**ART 065. Painting without a Trace: Introduction to Vector-Based Image Making and Printing (4)**

Lecture, 3 hours; laboratory, 4 hours; individual study, 2 hours. An introduction to digitally based drawing, painting, and printing. Focuses on digital software such as Adobe Illustrator, Photoshop, and Corel Painter to create paintings without the use of traditional paint. Explores the relation of this new medium to traditional painting, drawing, and photography in history and practice. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination.

**ART 066. Introduction to Three-Dimensional Digital Modeling (4)**

Lecture, 3 hours; laboratory, 3 hours; individual study, 2 hours. Covers basic skills necessary to create three-dimensional digital images and models. Emphasizes techniques for polygon and curved-surface modeling and photorealistic image creation through material shading, texturing, and lighting. Introduces basic scripting methods to create complex models and images with Autodesk Maya or equivalent. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Cross-listed with CS 066.

**ART 067. Three-Dimensional Digital Modeling and Animation (4)**

Lecture, 3 hours; laboratory, 3 hours; individual study, 2 hours. Prerequisite(s): ART 066/CS 066. Builds advanced skills for three-dimensional modeling. Introduces basic computer animation techniques within framework of existing software. Techniques include rigging skeletons for character models, keyframing, and special effects animation using Autodesk Maya software or equivalent. Teaches proficiency in analog scripting operations. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 8 units. Cross-listed with CS 067.

**ART 070 (E-Z). Digital Imaging Software for the Visual Arts (2)**

Lecture, 10 hours per quarter; laboratory, 30 hours per quarter; individual laboratory, 4 hours per quarter. Trains the student in basic digital image manipulation software skills in preparation for digital image applications across varied media. E. Introduction to Image Manipulation (PhotoShop); F. Introduction to Video Editing (Finalcut Pro, Avid, Media 100); G. Introduction to Web Authoring (Dreamweaver, QuickTime); I. Introduction to Graphic Design and Desktop Publishing (Quark). Each segment is repeatable as its topics change to a maximum of 8 units.

**ART 071 (E-Z). Photographic Materials and Processes (2)**

Lecture, 15 hours per quarter; laboratory, 15 hours per quarter. Prerequisite(s): ART 003 or consent of instructor. In-depth instruction of conventional (i.e., nondigital) photographic processes. Instruction is primarily technical; involves some discussion of application to contemporary art. F. View Camera Workshop; K. Technical Issues of Basic Black and White Photography; M. Technical Issues of Color Photography; N. Intermediate Technical Aspects of Black and White Photography; O. Intermediate Technical Issues of Film-Based Digital Photography. Segments are repeatable.

**ART 075 (E-Z). Sculpture Materials and Processes (2)**

Workshop, 10 hours per quarter; laboratory, 3 hours. Each topic focuses on a single art-making process. Provides in-depth understanding for the beginning sculpture student and a project-derived technique. E. Metal; F. Mold-Making; G. Plaster and Clay; J. Wood. Each segment is repeatable to a maximum of 8 units.

## Upper-Division Courses

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**ART 102. Intermediate Drawing (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): ART 001 and ART 002 or equivalent and consent of instructor. An intermediate course of study. Subject: primarily still life, landscape and non-figurative images; purpose: a fuller understanding of the technical and expressive aspects of drawing. Studio exercises and in-studio lectures. Course is repeatable to a maximum of 8 units with consent of instructor.

**ART 103. Advanced Drawing (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): ART 102: Intermediate Drawing, or equivalent and consent of instructor. An advanced course of study in drawing techniques and the employment of the drawing medium as a terminal means of artistic expression. Course is repeatable to a maximum of 12 units.

**ART 104. Life Drawing (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): ART 001 and ART 002 or equivalent and consent of instructor. Media to be pencil, charcoal, pen and ink; subject, primarily the figure; purpose, a fuller understanding of the figure and figure composition; method combines lectures with exercises in studio and outside assignments. Course is repeatable to a maximum of 12 units.

**ART 110. Intermediate Painting (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): ART 001 and ART 002 or equivalent and consent of instructor. Subject primarily still-life, landscape and figure; its purpose a fuller understanding of the technical aspects of painting; its method studio exercises, in-studio lectures and outside assignments. Course may be repeated for credit to a total of 12 units.

**ART 111. Advanced Painting (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): ART 110 and consent of instructor. Advanced problems in figurative and non-figurative painting. Emphasis on the development of personal direction. Investigation of the individual student's relation to contemporary ideas in painting. In-studio lectures, studio exercises, and outside assignments. May be repeated for credit to a total of 12 units.

**ART 112 (E-Z). Painting Materials and Processes (2)**

Workshop, 1 hour; studio, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on selected special techniques or approaches to painting. E. Supports, Grounds, Underpainting, and Blending; F. Glazing, Varnishing, and Layering. G. Big Collaborative Painting; I. All Paint. Each segment is repeatable to a maximum of 12 units. **Giegerich in charge**

**ART 115. Intermediate Sculpture (4)** Lecture, 3 hours; studio, 3 hours. Prerequisite(s): ART 005. Develops the necessary critical and imaginative faculties for making sculpture. Through project assignments, students explore associations between materials, forms, and context to construct or deconstruct ideas. Audiovisual presentations, readings, and group critiques survey twentieth-century modern sculpture and more recent practices. Examines the artist's role in the cultural landscape of spectacle and entertainment. Course is repeatable to a maximum of 12 units.

**ART 125. Sculpture Hybrid: Furniture, Architecture, Decoration (FAD) (4)**

Lecture, 3 hours; laboratory, 3 hours; consultation, .5-1.5 hours per quarter. Prerequisite(s): ART 005, ART 115; or consent of instructor. Introduces the sculptural object that exists as or in relationship to furniture, architecture, and interior decoration. Includes an overview of work that defies classification as art or design such as the Bauhaus movement, through utopian American mid-century design and architecture and Italian-based Memphis design, to contemporary art-making practices. Explores theoretical challenges inherent in this art-making strategy.

**ART 131. Intermediate Photography and Digital Technology (4) F**

Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ART 003 or consent of instructor. Covers the complete cycle of photographic production from scanning to output. Emphasizes developing skill in creating digital photographic imagery for creative and cultural expression. Software and some digital equipment are provided. A 35mm single lens reflex (SLR) or digital cameras and flash drives are required. Course is repeatable to a maximum of 8 units. Cross-listed with MCS 131.

**ART 133. Art Workshop (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): 8 upper-division units in Art or consent of instructor. Emphasizes interrelationship of the arts. Includes development of individual projects in varied media as facilities permit. Course is repeatable to a maximum of 12 units.

**ART 134. Mixed Media (4)**

Lecture, 3 hours; studio, 3 hours. Prerequisite(s): ART 001 and ART 002. Exploration into experimental methods for creating an image; techniques of frottage, collage, photo transfer, modeling and mold making, assemblage.

**ART 135. Intermedia: Art, Media, and Culture (4)**

Lecture, 2 hours; screening, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of performance, photography, video, film, television, installation, and other related "intermedias." Focuses on artworks within and without the mass media: how they are constructed, documented, analyzed, and viewed in the larger context of culture. Cross-listed with MCS 135.

**ART 136. Installation and Site-Specific Art (4)**

Lecture, 3 hours; studio, 3 hours. Prerequisite(s): consent of instructor. Focuses on performance, photo installation, computer art, video/film, site-specific installation, sculpture, and/or other intermedia. Concentrates on production and analysis of site-specific art. Course is repeatable to a maximum of 8 units. Cross-listed with MCS 136.

**ART 137. Advanced Sculpture (4) F, W, S**

Lecture, 3 hours; studio, 3 hours. Prerequisite(s): ART 115. Focuses on self-directed individual sculpture projects. Course is repeatable to a maximum of 12 units.

**ART 139. Intermediate Web-Based Art: Animation, Audio, and Interactivity (4) W**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 009 or consent of instructor. Explores the conceptual and creative possibilities of Web-based animation, audio, and interactive software at the intermediate level. Addresses the complex interconnections and unique quality of Internet-based art.

**ART 140. Intermediate Analog Photography (4)**

Lecture, 3 hours; studio, 4 hours. Prerequisite(s): ART 003 or consent of instructor. Focuses on developing individual creative approaches in analog photography and strengthening controls and techniques in black and white printing. Requires students to provide their own analog film cameras. Course is repeatable to a maximum of 12 units.

**ART 143. Advanced Digital Imaging Technology (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 003, ART 131/MCS 131. Covers advanced digital imaging technologies such as large-format scanning, printing, color correction, retouching, and color management. Emphasis is on technical skills. Includes individualized assignments and group critiques. Course is repeatable to a maximum of 12 units. **Zaki**

**ART 145. Advanced Photography Workshop (4)**

Lecture, 3 hours; studio, 4 hours. Prerequisite(s): ART 131/MCS 131, ART 140 or consent of instructor. A study of experimental advanced photographic techniques. Includes examination of critical and creative problems. Course is repeatable to a maximum of 12 units.

**ART 146 (E-Z). Topics in Advanced Photography (4)**

Lecture, 2 hours; studio, 4 hours. Prerequisite(s): ART 140; consent of instructor. An advanced studio course designed to focus on selected special techniques of or approaches to photography. Subject matter is determined by the instructor and may vary. K. Polaroid Photography; L. The Book and the Photograph; M. Dye Transfer; N. Current Art Practices; O. Suburbia and the Urban Edge; P. Fabricated to Be Photographed and the Directorial Mode; Q. Sycamore Canyon Photographic Project. ART 146Q is repeatable to a maximum of 12 units.

**ART 150. Intermediate Video Art (5)** Lecture, 3 hours; studio, 3 hours; screening, 3 hours. Prerequisite(s): ART 004/MCS 004. Designed to continue work done in ART 004/MCS 004. Covers advanced editing techniques and theory, storyboard, and sound design. Application of media arts to contemporary art practice and new genres, including installation, documentary, experimental, and performance. Equipment provided. Course is repeatable to a maximum of 10 units. Cross-listed with MCS 150.

**ART 155. Advanced Video and Film Art (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 150/MCS 150. Examines media arts in the context of contemporary art practice and digital video and film genres. Addresses issues of installation, experimentation, documentary, and performance. Explores various conceptual and methodological issues connected with time-based media. Course is repeatable to a maximum of 12 units.

**ART 160. Intermediate Art Theory (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ART 006/MCS 006. Addresses current critical and theoretical issues in modern and contemporary culture. Examines art production in light of contemporary and modernist art practice, theory, and history in relation to the interpretation and creation of art. Focuses on issues of race, gender, politics, aesthetics, class, and sexuality.

**ART 161. Special Topics in Art Criticism and Theory (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ART 006/MCS 006 and ART 160 with grades of "C" or better or consent of instructor. Advanced topics in contemporary art theory and criticism. Examines the reception, analysis, and theoretical underpinning of works of art in relation to contemporary and historical issues in the visual arts. Course is repeatable to a maximum of 12 units. Cross-listed with MCS 163.

**ART 162. Special Topics in New Genres of Art Practice (4) F, W, S**

Lecture, 2 hours; studio, 4 hours. Prerequisite(s): ART 006/MCS 006 and a beginning studio art course with grades of "C" or better or consent of instructor. Through group critiques, readings, and discussions, explores art making while introducing significant and recent practices in cultural production. Course is repeatable to a maximum of 12 units.

**ART 165. Painting without a Trace: Intermediate Vector-Based Image Making and Printing (4)**

Lecture, 3 hours; laboratory, 4 hours; individual study, 2 hours. Prerequisite(s): ART 065. Continues the investigation of two-dimensional digitally based drawing, painting, and printing (nonphotographic). Explores possibilities in combining traditional and digital painting techniques. Examines the relationship between this new medium and traditional painting and drawing. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 8 units.

**ART 167. Intermediate Digital Media: Web Authoring (4)**

Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ART 009 or consent of instructor. Examines the histories, myths, and technical particularities of the Web from the artist's perspective. Includes art projects that are site-specific to the Internet. Explores issues including access, interface design, activism, multiple narratives, programming, and code. Does not cover software training or commercial graphic design.

**ART 168. Intermediate Digital Media: Interactive Technology (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): digital art course or consent of instructor. Create interactive digital artworks in both time-based and environmental forms; explore issues including interactivity, interface design, activism, and multiple narratives. Does not cover software training or commercial graphic design.

**ART 169 (E-Z). Digital Imaging Software for the Visual Arts: Intermediate Software Skills (1)**

Lecture, 6 hours per quarter; laboratory, 12 hours per quarter. Prerequisite(s): ART 007/MCS 007 or consent of instructor. Covers digital imaging application across varied media. Includes Web design, digital video editing, video compositing and effects, Web authoring, digital photography, and desktop publishing. Targets specific software that aid in developing digital production skills that can be applied to a wide array of intermediate course work. E. Image Manipulation (Adobe Photoshop); F. Video Editing (FinalCut Pro, Avid, Media 100); G. Web Authoring (Dreamweaver, QuickTime); J. Graphic Design and Desktop Publishing (Quark). Each segment is repeatable to a maximum of 3 units.

**ART 171. Intermediate and Advanced Sculpture and Digital Technology (4)**

Lecture, 2 hours; laboratory, 4 hours; individual study, 2 hours. Prerequisite(s): ART 005, ART 066/CS 066. Covers intermediate and advanced three-dimensional modeling and printing resulting in sculpture derived entirely from the computer. Emphasizes individual projects with the potential to create both computer-based models and material-based sculptures. Discusses new digitally based sculptural possibilities in relation to historical sculptural practice. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 8 units.

**ART 175. Advanced Digital Workshop (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 131/MCS 131 or ART 139 or ART 150/MCS 150. Designed to encourage the development of individual projects utilizing digital technology. Areas of inquiry may include, but are not limited to, digital imaging, Web-based works, forms of digital publishing, digital video, and digital multimedia installation. Involves laboratory exercises, lectures, discussion of articles and exhibitions, and self-directed assignments. Course is repeatable to a maximum of 12 units.

**ART 180. Contemporary Issues and Practice (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): any lower-division studio art course. A course structured around a sequence of three to six visiting artists, authors, and critics. Visitor presentations will be augmented by relevant articles and in-class presentations. Students generate written and oral responses to specific artists and topics. Artists and topics to be determined by the instructor. Course is repeatable to a maximum of 12 units.

**ART 185. Senior Thesis Seminar (4)**

Seminar, 3 hours; preparatory work, 3-6 hours. Prerequisite(s): senior standing in Art; 32 units of upper-division studio art courses; review of preliminary portfolio two quarters before intended enrollment. Independent work and group seminars; completion of thesis statement and presentation of a finished body of work to faculty thesis committee. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ART 185 or ART 195.

**ART 190. Special Studies (1-5)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Total credit may not exceed 8 units.

**ART 195. Senior Thesis (4)** independent work, 12 hours. Prerequisite(s): completion of 32 units of upper-division studio art courses, review of a preliminary portfolio two quarters prior to intended enrollment; or consent of faculty advisor. The student produces and presents a finished body of work to the faculty. Credit is awarded for only one of ART 185 or ART 195.

**ART 198-I. Individual Internship (1-12)** field, 2 hours per unit. Prerequisite(s): consent of instructor and upper-division standing. Work with an appropriate professional individual or organization to gain experience and skills in the student's chosen art specialty. Letter grade or Satisfactory (S)/No Credit (NC). Repeatable to a total of 16 units; maximum of 4 units count toward major in Art.

## Graduate Courses

**ART 230. Contemporary Critical Issues (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Focused analysis of contemporary issues of art and media practice communications theory. Investigates painting, sculpture, photography, digital practice, film, video, fiction, feminism, multicultural studies, and gay and lesbian studies. Involves readings, screenings, visiting artists or critics, and field trips. Course is repeatable to a maximum of 12 units.

**ART 240. Current Topics in Critical Theory (4)**

Seminar, 3 hours; extra reading, 3 hours; outside research, 2-3 hours. Prerequisite(s): graduate standing; ART 006/MCS 006 and ART 160 or equivalents or consent of instructor. Selected theoretical systems as applied to modern, postmodern, and post-postmodern art. Course is repeatable as topics change to a maximum of 12 units.

**ART 285. Peer Critique (4) F, W, S** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides a serious and sophisticated environment for peer critique of studio production. Involves readings, screenings, and field trips. Course is repeatable to a maximum of 12 units.

**ART 290. Directed Studies (1-6) F, W, S** Individual study, 3-18 hours; studio, 3-6 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics. Course is repeatable to a maximum of 28 units.

**ART 292. Concurrent Studies in Art (1-4)** Outside research, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor. Taken concurrently with a 100-series course but on an individual basis. Involves research, critique, studio production, or written work commensurate with the number of units elected. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ART 299. Research for Thesis (1-4)** Outside research, 1-6 hours; studio, 3-6 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor; satisfactory completion of 28 graduate units in the Masters of Fine Arts program. Individual research with faculty advisor in preparation for comprehensive exhibition for the degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**ART 302. Teaching Practicum (1-4)** Practicum, 2-8 hours; consultation, 1-4 hours. Prerequisite(s): graduate standing. Provides supervision of teaching in undergraduate Art courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Art History

**Subject abbreviation: AHS**  
**College of Humanities, Arts, and Social Sciences**

Patricia A. Morton, Ph.D., Chair  
Department Office, 232 Arts  
(951) 827-4634; [arthistory.ucr.edu](http://arthistory.ucr.edu)

### Professors

Malcolm Baker, Ph.D., *Distinguished Professor*  
Jonathan W. Green, M.A. (Art/Art History)  
Conrad Rudolph, Ph.D.

### Professors Emeriti

Dericksen M. Brinkerhoff, Ph.D.  
Françoise Forster-Hahn, Ph.D.  
Ginger C. Hsü, Ph.D.  
Thomas O. Pelzel, Ph.D.

### Associate Professors

Liz Kotz, Ph.D.  
Jeanette Kohl, Ph.D.  
Patricia A. Morton, Ph.D.

### Assistant Professors

Susan Laxton, Ph.D.  
Stella Nair, Ph.D.  
Kristoffer Neville, Ph.D.  
Jason Weems, Ph.D.

\*\*

### Cooperating Faculty

Karl A. Taube, Ph.D. (Anthropology)

## Major

The Art History major provides the framework

for the critical study of a wide range of global visual culture from different periods of human history and in all media.

The department works closely at both the undergraduate and graduate levels with the UCR California Museum of Photography to give students an opportunity to work with archival and art photographs and with the Jack and Marilyn Sweeney Art Gallery to provide access to cutting-edge multimedia works of art and to give the possibility of gaining curatorial experience.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Undergraduate Studies section.

## Major Requirements

### Art History Major

The major requirements for the B.A. in Art History are as follows: (52 units)

1. Lower-division requirements (12 units): one lower-division course in each of the three major areas. Note: No course that appears in more than one area can be repeated.

a) Pre-modern: AHS 015, AHS 017A, AHS 017B, AHS 018/AST 018, AHS 027/ANTH 027

b) Early Modern: AHS 015, AHS 017B, AHS 017C, AHS 018/AST 018, AHS 023, AHS 028

c) Modern/Contemporary: AHS 008, AHS 017C, AHS 020/MCS 023, AHS 021/URST 021, AHS 023, AHS 028

2. Upper-division requirements (40 units)

a) AHS 192

b) Two courses in each of the major areas (24 units). Note: No course that appears in more than one area can be repeated.

(1) Pre-modern: AHS 102/ANTH 102, AHS 112, AHS 116, AHS 117, AHS 140/AST 140, AHS 143/AST 143, AHS 144/AST 144, AHS 147,

AHS 148, AHS 155, AHS 156, AHS 157, AHS 159

(2) Early Modern: AHS 113, AHS 116, AHS 117, AHS 134/HISE 134, AHS 141/AST 141, AHS 143/AST 143, AHS 144/AST 144, AHS 146/AST 147, AHS 161, AHS 162, AHS 164, AHS 165/HISE 133/WMST 170, AHS 166/WMST 169, AHS 168, AHS 169, AHS 170, AHS 171, AHS 172, AHS 173, AHS 174, AHS 175, AHS 177, AHS 178, AHS 179

(3) Modern/Contemporary: AHS 115/LNST 115, AHS 116, AHS 120/EUR 110B/CPLT 110B/MCS 178/GER 110B, AHS 134/HISE 134, AHS 135, AHS 136/MCS 137, AHS 137/MCS 138, AHS 146/AST 147, AHS 174, AHS 175, AHS 176/MCS 176, AHS 177, AHS 179, AHS 180, AHS 181, AHS 182, AHS 184/URST 184, AHS 185/URST 185, AHS 186/MCS 186, AHS 187/MCS 187, AHS 188, AHS 189(E-Z)

3. Twelve (12) elective units of upper-division course work in Art History chosen from the three major areas

### Art History/Administrative Studies Major

The major between the departments of Art History and Business Administration provides students with training in management and the history of art. The major requirements for the B.A. degree in Art History/Administrative Studies are as follows:

**Art History requirements** (48 units)

1. Lower-division requirements (12 units): one lower-division course in each of the three major areas. Note: No course that appears in more than one area can be repeated.

a) Pre-modern: AHS 015, AHS 017A, AHS 017B, AHS 018/AST 018, AHS 027/ANTH 027

b) Early Modern: AHS 015, AHS 017B, AHS 017C, AHS 018/AST 018, AHS 023, AHS 028

c) Modern/Contemporary: AHS 008, AHS 017C, AHS 020/MCS 023, AHS 021/URST 021, AHS 023, AHS 028

2. Upper-division requirements (36 units):

a) AHS 192, Junior and Senior Seminar (4 units)

b) Two courses (24 units total) in each of the major areas (Pre-modern, Early Modern, Modern/Contemporary) Note: No course that appears in more than one area can be repeated.

c) Eight (8) elective units of upper-division course work in Art History chosen from the three major areas.

**Administrative Studies requirements**

(37 units)

1. Lower-division requirements (17 units)
  - a) BUS 010, BUS 020
  - b) STAT 048 or equivalent (may be used to satisfy breadth requirements)
  - c) CS 008 (may be used to satisfy breadth requirements)
2. Upper-division requirements (20 units)
  - a) Two courses (8 units) from the list below:
    - (1) ECON 102 or ECON 104A or ECON 130 or ECON 162/BUS 162
    - (2) PSYC 140 or PSYC 142
    - (3) SOC 150 or SOC 151 or SOC 171
    - (4) POSC 181 or POSC 182 or POSC 183
    - (5) ANTH 127 or ANTH 131

These two courses must be outside the discipline of Art History and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.
  - b) A three-course track (12 units) in Business Administration courses from one of the following:
    - (1) Organizations (General): BUS 100, BUS 107, BUS 176/SOC 176, BUS 158/ANTH 105, SOC 150, SOC 151
    - (2) Human Resources Management/Labor Relations: BUS 100, BUS 107, BUS 152/ECON 152, BUS 153/ECON 153, BUS 155, BUS 157, PSYC 142
    - (3) Business and Society: BUS 100, BUS 102, BUS 107, PHIL 116, POSC 182, POSC 186
    - (4) Marketing: BUS 103, and two from BUS 112, BUS 113, BUS 114, BUS 117
    - (5) Managerial Accounting/Taxation: BUS 108, and two from BUS 166, BUS 168A, BUS 168B
    - (6) Financial Accounting: BUS 108, BUS 165A, BUS 165B
    - (7) Finance: BUS 106/ECON 134 and two from BUS 134, BUS 136, BUS 137, BUS 138, BUS 139
    - (8) Management Information Systems: BUS 101, BUS 171, BUS 173
    - (9) Production Management: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

**Note** In filling the dual requirements of the major students may not count more than two courses toward both parts of their total requirements (Art History requirements and Administrative Studies requirements).

**Art History/Religious Studies Major**

The Art History/Religious Studies Major combines the disciplinary interest in the history

of the visual arts with its related religious content and background.

**Major Requirements**

The major requirements for the B.A. degree in Art History/Religious Studies are as follows:

**Asian Concentration** (52 units)

1. Lower-division requirements (12 units)
 

AHS 015, AST 030/CHN 030, RLST 005
2. Upper-division requirements (40 units)
  - a) Art History (16 units): AHS 140/AST 140, AHS 141/AST 141, AHS 143/AST 143, CPLT 141
  - b) Religious Studies (24 units): choose from RLST 101, RLST 103, RLST 105, RLST 106, RLST 142/AST 142/CHN 142, RLST 144/CPLT 144
3. Optional 190-level work in either Art History or Religious Studies

**Student-designed Comparative Concentration** (52 units)

1. Lower-division requirements (12 units)
  - a) Art History, choose at least 4 units: AHS 015, AHS 017A, AHS 017B, AHS 017C, AST 030/CHN 030
  - b) Religious Studies, choose at least 4 units: RLST 005, RLST 007, RLST 010
2. Upper-division requirements (40 units)
  - a) Art History, choose at least 12 units: AHS 140, AHS 141, AHS 143, AHS 155, AHS 156, AHS 157, AHS 159, AHS 161, AHS 162, AHS 164, AHS 171, AHS 172, CPLT 141
  - b) Religious Studies, choose at least 12 units: RLST 100, RLST 101, RLST 103, RLST 105, RLST 106, RLST 111, RLST 121, RLST 128 (E-Z), RLST 130, RLST 131, RLST 135/HISE 130, RLST 136, RLST 142/AST 142/CHN 142, RLST 144/CPLT 144
3. Optional 190-level work in either Art History or Religious Studies

**Western Concentration** (At least 52 units)

1. Lower-division requirements (16 units)
  - a) Art History: AHS 017A, AHS 017B, AHS 017C
  - b) Religious Studies, choose at least 4 units: RLST 007, RLST 010
2. Upper-division requirements (36 units)
  - a) Art History (16 units): choose from AHS 155, AHS 156, AHS 157, AHS 159, AHS 161, AHS 162, AHS 164, AHS 171, AHS 172
  - b) Religious Studies (20 units): choose from RLST 100, RLST 111, RLST 121, RLST 128 (E-Z), RLST 130, RLST 131, RLST 135/HISE 130, RLST 136
3. Optional 190-level work in either Art History or Religious Studies

**Minor**

The minor upper-division requirements are designed to encourage study across art-historical areas, while providing the opportunity for some concentration in one specific area.

Requirements for the minor in Art History are as follows:

1. Lower-division requirements (8 units): One lower-division course from two of the three major areas. Note: No course that appears in more than one area can be repeated.
  - a) Pre-modern: AHS 015, AHS 017A, AHS 017B, AHS 018/AST 018, AHS 027/ANTH 027
  - b) Early Modern: AHS 015, AHS 017B, AHS 017C, AHS 018/AST 018, AHS 023, AHS 028
  - c) Modern/Contemporary: AHS 008, AHS 017C, AHS 020/MCS 023, AHS 021/URST 021, AHS 023, AHS 028
2. Upper-division requirements: Sixteen (16) upper-division units selected from the three areas listed under the major (No more than 8 units may be selected from any one area.)

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

**Graduate Program**

The Department of Art History offers the M.A. degree in Art History.

**Master's Degree**

For graduate study, the department offers upper-division and graduate courses in the history of European, U.S., Central and Latin American, and Asian (primarily Chinese) visual culture from ancient to contemporary times (including the history of photography), emphasizing the interpretation of visual culture in its historical and cultural context. The master's degree may be completed in two years; the first year focuses on course work, the second on researching and writing a thesis. The study of works of art, visual culture imagery, and archival material is facilitated by regional museums, libraries, and collections, including, most notably, the campus's own California Museum of Photography. Students are encouraged to enroll in arts internships offered by institutions across Southern California (including the Los Angeles County Museum of Art, the J. Paul Getty Institute and Museum, the Museum of Contemporary Art, the Japanese American National Museum, the Huntington Library, and the dozens of other institutions in the area) and can receive course credit for doing so.

**Admission** The graduate committee meets once a year to consider applications to the program (due January 5 for financial aid consideration; all prospective students are strongly encouraged to apply by that date). Only fall quarter admission is available. All applicants must submit scores for the GRE General Test.

**Plan I (Thesis)** The curriculum is divided into three broad areas of study: pre-modern, early modern, and modern/contemporary. The courses in each of the three areas are distributed as follows:

Pre-modern: AHS 102/ANTH 102, AHS 112, AHS 140/AST 140, AHS 143/AST 143, AHS 144/AST 144, AHS 147, AHS 148, AHS 155, AHS 156, AHS 157, AHS 159, AHS 272, AHS 285

Early-modern: AHS 113, AHS 134/HISE 134, AHS 141/AST 141, AHS 143/AST 143, AHS 144/AST 144, AHS 146/AST 147, AHS 161, AHS 162, AHS 164, AHS 165/HISE 133/WMST 170, AHS 166/WMST 169, AHS 171, AHS 172, AHS 173, AHS 177, AHS 252, AHS 260, AHS 267, AHS 273, AHS 274, AHS 285

Modern/Contemporary: AHS 115/LNST 115, AHS 120/EUR 110B/CPLT 110B/MCS 178/GER 110B, AHS 121/GER 138/CPLT 138/EUR 138/MCS 182, AHS 134/HISE 134, AHS 135, AHS 136/MCS 137, AHS 137/MCS 138, AHS 146/AST 147, AHS 176/MCS 176, AHS 177, AHS 178/URST 178, AHS 180, AHS 181, AHS 182, AHS 184/URST 184, AHS 185/URST 185, AHS 186/MCS 186, AHS 187/MCS 187, AHS 252, AHS 260, AHS 276, AHS 277, AHS 278, AHS 282, AHS 283, AHS 284, AHS 285.

Students must complete 40 units of course work, of which at least 24 units must be earned in graduate courses. In addition to AHS 251P (Proseminar in Methodology), students must take one graduate seminar in their area of specialization and two graduate seminars outside their chosen area. To fulfill the 20 units (two graduate seminars plus three additional graduate or upper-division courses) required for breadth, students must take courses in as many historical periods, cultural traditions, and geographic areas as possible. The graduate advisor oversees the selection of courses, making sure that at least two fulfill this historical-cultural-geographical diversity by being in areas (as defined above) outside of that in which the student is specializing. To fulfill degree requirements, students may also take courses — with the approval of the graduate advisor — in visual culture offered by the departments of Anthropology, Media and Cultural Studies, or other departments or programs at UCR or other UC campuses.

Students may take as many units of AHS 297 and AHS 299 (thesis research and writing) as desired, but only 12 of these units may be applied to the 24 graduate units required for the degree.

The thesis is the culminating requirement for the degree. Students must complete a successful oral discussion (the “Thesis Meeting”) prior to filing the completed thesis. The thesis should be filed within one year after completing all formal course work.

**Language Requirement** Students must demonstrate proficiency in one research language (in addition to English) appropriate to their area of study. The relevant language is chosen in consultation with the graduate advisor and, if possible, the potential M.A. thesis advisor. Ideally, the student should acquire this language proficiency before entering the program. If this is not the case, the language requirement should be fulfilled before the fourth quarter in residence. This requirement is meant to provide the student with an understanding of a foreign language so that the student can perform graduate level research in this language. Since most Ph.D. programs have additional language requirements, students planning to obtain a Ph.D. are strongly urged to consult with their graduate and thesis advisors regarding additional foreign language recommendations.

To satisfy the language requirement, the student has several options, which are outlined in the department’s Graduate Student Handbook. Most commonly, students, while enrolled as graduate students, complete, with a grade of “B” or better, a UC language course equivalent to one of the following UCR classes.

CHN 006  
FREN 004  
GER 004  
ITAL 004  
JPN 006  
SPN 006

## Lower-Division Courses

### AHS 007. World Art: Images, Issues, and Ideas (4)

Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. An introduction to artistic achievements of the world’s cultures and ways in which they can be viewed. Considers such issues as the use of artworks as historical documents; connections between “high art” and popular culture; and the relationship between artist, viewer, artistic tradition, and society.

**AHS 008. Modern Western Visual Culture (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Focuses on broadly defined cultural practices in relation to painting, photography, video, architecture, and film. Introduces historical, aesthetic, and theoretical issues in twentieth-century visual culture, emphasizing political and social themes relevant to contemporary life. **Kotz**

**AHS 015. Arts of Asia (4)** Lecture, 3 hours; discussion, 1 hour; outside research, 2 hours. Prerequisite(s): none. A survey of the major monuments and themes of the visual arts of India, China, and Japan. Topics include recent archaeological discoveries, Buddhist art, Hindu sculpture and architecture, Zen in art, and the development of Asian pictorial art.

**AHS 017A. History of Western Art: Prehistoric to Byzantine (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. A survey of the visual arts of the ancient Near East and Egypt, the Greek world, and the Roman and Byzantine empires. Topics include the growth of urbanism, art as an expression of religious and political beliefs, and cultural contact as a source of artistic change. Credit is awarded for only one of AHS 017A or AHS 17HA.

**AHS 017B. History of Western Art: Medieval to Renaissance (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. A survey of the visual arts of Europe in the Middle Ages and Renaissance. Topics include the religious and political functions of art in the reestablishment of high civilization and the increased status of the individual artist. **Rudolph**

**AHS 017C. History of Western Art: Baroque to Modern (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. A survey of the visual arts of Europe and America from 1600 through the present. Topics include the religious and political roles of art, the rise of secular imagery, the increased role of women in the arts, and the impact of popular culture and photography, and the other new media in the visual arts.

**AHS 17HA. Honors History of Western Art: Prehistoric to Byzantine (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to AHS 017A. A survey of the visual arts of the ancient Near East and Egypt, the Greek world, and the Roman and Byzantine empires. Topics include the growth of urbanism, art as an expression of religious and political beliefs, and cultural contact as a source of artistic change. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of AHS 017A or AHS 17HA.

**AHS 018. Introduction to Writing and Painting in China (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): none. An introduction to Chinese calligraphy and painting, focusing on their development in history and their practice in Chinese society. Topics include the development of writing technique and style, the integration of writing and painting, and the world around the Chinese artist. Cross-listed with AST 018.

**AHS 020. Introduction to Media Art (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the impact of media technology on the visual arts, from photography to the Internet. Addresses mechanical reproduction, perception, gender, sexuality, identity, interactivity, cybernetics, and popular culture. Cross-listed with MCS 023.

**AHS 021. Introduction to Architecture and Urbanism (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the built environment including buildings, gardens, and cities, examined in terms of historical, cultural, social, technological, and political factors. Emphasis is on examples from Southern California. Cross-listed with URST 021. **Morton**

**AHS 023. Introduction to American Art (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Surveys the art and visual culture of North America (primarily in the United States) from the first European contact to the present. Emphasizes visual representation as means for cultural encounter; the construction of race, class and gender; and the relationship between art, nation, and identity.

**AHS 027. Art of Pre-Columbian America (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. A survey course intended to provide an up-to-date background to the ancient art of Mexico, Central America, and the Andean region of western South America. The various peoples and art of pre-Columbian America are discussed according to the three broad cultural regions of Mesoamerica, the Intermediate Area (lower Central America and northwestern South America), and Andean area. Lectures are illustrated with slides of particular sites and important examples of pre-Columbian art. Cross-listed with ANTH 027. **Taube**

**AHS 028. Art and Architecture of Latin America (4)**

Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours. Introduces Latin American art and architecture from the European conquest to the present. Topics include religious and secular art and architecture, hybridization of indigenous and imported styles, national styles after independence, Mexican murals, women artists, Latin American modernism, and Chicano and Border art.

**AHS 030. Rome: The Ancient City (4)** Lecture, 3 hours; extra reading, 3 hours. Traces the development of the city of ancient Rome. By studying the literary and historical evidence alongside the physical remains of the city—its monuments, art, and historical and archaeological remains—this course seeks to introduce students to the Romans and to their importance for later ages. Cross-listed with CLA 017 and HIST 027.

## Upper-Division Courses

**AHS 102. Anthropology of Art (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Anthropological approaches to the study of art in traditional non-Western societies. Through specific readings and case studies from four geographic regions (North America, Southeast Asia, Oceania, and West Africa), the dynamic role of art in traditional societies is illustrated. Cross-listed with ANTH 102. **Taube**

**AHS 112. The Art of the Aztec Empire (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 027/ANTH 027 or upper-division standing or consent of instructor. Introduction to the art of the Aztec Empire, including architecture, sculpture, ceramics, painting, lapidary work, gold work, and feather work. Through a close study of objects, explores the relationship between art and ritual and art and the imperial state.

**AHS 113. Sixteenth-Century Mexico: An Art of Two Worlds (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 028 or upper-division standing or consent of instructor. Explores the art of the first colonial century in Mexico. Investigates the translation of European art forms to the New World, the fate of indigenous traditions, and artistic change in the context of colonialism and evangelization.

**AHS 115. Modern and Contemporary Art of Latin America (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 028 or upper-division standing or consent of instructor. A study of Latin American art from circa 1900 to the present. Considers national and regional histories and artistic trajectories, beginning with the advent of an artistic avant-garde, and investigates the relationships between European and Latin American developments. Cross-listed with LNST 115.

**AHS 116. Architecture and Arts of the Andes (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 027/ANTH 027 or upper-division standing or consent of instructor. An introduction to architecture, urbanism, and related material culture of the Andes from ancient times to the present. Focuses on the diverse and rich architectural heritage of an important building center in the Americas. Addresses architecture's relationship to artistic and material production, such as painting, pottery, sculpture, city planning, and textiles. **Nair**

**AHS 117. Visual Culture of the Incas (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the art, architecture, and urban form of the Inca civilization. Examines how these elements influenced state formation, conquest, and resistance. Includes studies of urban plans, buildings, paintings, textiles, prints, sculpture, metalwork, and ceramics. **Nair**

**AHS 120. Berlin Metropolis in Literature, Film, Music, and Art (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the metropolis Berlin as gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. A study of Berlin's dramatic transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course is conducted in English. Cross-listed with CPLT 110B, EUR 110B, GER 110B, and MCS 178.

**AHS 121. From Expressionism to Epic Theatre: Benn, Brecht, Kafka, and the Bauhaus (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction of the German avant-garde of the twentieth century. Explores expressionism, New Objectivity, the Bauhaus movement, the manifestation of an anti-art in dadaism, and Epic Theatre. Studies works of Franz Kafka in the context of his implicit criticism of the avant-gardist movements of his time. Course is conducted in English. Cross-listed with CPLT 138, EUR 138, GER 138, and MCS 182.

**AHS 134. Art and Society: Patrons and Museums (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how patrons and museums have influenced the production and reception of art. Topics include patronage, collecting, and audience for art in Renaissance Italy; modern American megapartners, such as the Gettys and Rockefellers; and multimedia museum programs used to educate a wider public in the visual arts. Cross-listed with HISE 134.

**AHS 135. Postmedia Art (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Covers heterogeneous movements, theories, and practices from the 1960s to the present that have collectively challenged the doctrine of medium specificity. Topics may include dematerialization, conceptual and postconceptual art, performance and body art, earthworks, process art, and experimental sound and radio. **Rogers**

**AHS 136. History of Video Art (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Traces the evolution of video art from the invention of the Portapak and early video collectives to the current ubiquity of video installation, single-channel, and multimedia art. Emphasis is on video art in the United States. Cross-listed with MCS 137. **Rogers**

**AHS 137. History of Experimental Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. A survey of cinema outside of the economic, institutional, and aesthetic imperatives of mainstream film production. Covers an array of alternative film movements, including surrealism and dada, Soviet avant-garde, the Cine 16 Group, French new wave, North American avant-garde, and the artist's film. Cross-listed with MCS 138.

**AHS 140. Chinese Painting of the Song and Yuan Dynasties (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. The history of early Chinese painting, from the beginning to the fourteenth century, with concentration on the Song and Yuan dynasties (A.D. 960-1367). The development of themes, subjects, styles, theories, and purposes discussed in their cultural and historical contexts. Cross-listed with AST 140.

**AHS 141. Chinese Painting of the Ming and Qing Dynasties (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. The history of later Chinese painting (from the fourteenth to the eighteenth century). Investigates new pictorial genres, art theories, political environment, popular taste, and the changing social role of the artist. Cross-listed with AST 141.

**AHS 143. Text and Image in Chinese Painting (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. Examines the art of writing and painting in China, focusing on the close relationship between written language and pictorial image. Reading knowledge of the Chinese language is not necessary. Cross-listed with AST 143.

**AHS 144. Japanese Painting: Twelfth to Nineteenth Century (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. Major developments in the pictorial art of Japan from the twelfth to the nineteenth century. Emphasis on the social and cultural contexts of painting, pictorial genres, and pivotal artists and styles. Cross-listed with AST 144.

**AHS 146. The Japanese House (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. History of the traditional Japanese house from prehistoric times to the nineteenth century. Examples used to place the Japanese house within the general history of Japanese architecture and within its social and cultural context. Cross-listed with AST 147. **Morton**

**AHS 147. The Art of Greece (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 017A or upper-division standing or consent of instructor. The architecture, sculpture, painting, and minor arts of Ancient Greece from the earliest Archaic period through the Hellenistic age.

**AHS 148. The Art of Rome (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 017A or upper-division standing or consent of instructor. The architecture, sculpture, painting, and minor arts of Ancient Rome from the Republic through the Age of Constantine with a consideration of the problems of the relationship of Hellenistic art to that of Rome.

**AHS 155. Cultures in Conflict: Art at the Fall of the Roman Empire (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017A or upper-division standing or consent of instructor. Covers architecture, mosaic, wall painting, manuscript illumination, and sculpture from the origins of Christianity to the final dissolution of the Roman Empire. Stresses the role of art in the co-optation of the Church by the Empire and then in the aftermath of its fall. **Rudolph**

**AHS 156. Memory of Empire: the Art of Early Medieval Europe (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Covers manuscript illumination, barbarian jewelry, architecture, and sculpture from the fall of the Roman Empire, through the Carolingian Empire, to the tenth century. Stresses the interplay between indigenous Germanic and "foreign" classical traditions. **Rudolph**

**AHS 157. The Medieval Pilgrimage and the Art of Romanesque France (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Covers architecture, sculpture, and illuminated manuscripts of the eleventh and twelfth centuries. Stresses the role of the pilgrimage and of politics during the period of the

revival of monumental architecture and of perhaps the greatest public sculpture of the Middle Ages. **Rudolph**

**AHS 159. The Gothic Cathedral in its Urban Context (4)** Lecture, 3 hours; extra reading, 3 hours.

Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Covers architecture, sculpture, and stained glass in the twelfth and thirteenth centuries. Stresses the political origins and social setting of public art during this period of the reestablishment of urban culture with its resultant social tensions. **Rudolph**

**AHS 160. Renaissance Architecture (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): an art history course or consent of instructor. An introduction to architecture in the period 1400-1600. Explores the major ideas and trends in architecture that took form in this period, including the architects and the ideas that motivated them in their historical context.

**AHS 161. Italian Renaissance: Fifteenth- and Sixteenth-Century Florence (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Surveys all media—paintings, sculpture, architecture, and gardens—within their historical and cultural context.

**AHS 162. Italian Renaissance: Fifteenth- and Sixteenth-Century Rome (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Surveys all media—paintings, sculpture, architecture, and gardens—within their historical and cultural context.

**AHS 163. Renaissance in Venice: West meets East (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. An introduction to the art and culture of Venice circa 1420-1600. Addresses central issues of artistic, cultural, and intellectual exchange among Venice, the Eastern Mediterranean, and the North. Discusses major artworks in the fields of painting, sculpture, and architecture.

**AHS 164. The Northern Renaissance (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Surveys the paintings of the Netherlands and Germany within their historical and cultural, mainly religious, context.

**AHS 165. Women Artists in Renaissance Europe, 1400-1600 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Surveys the lives and work of women artists in Renaissance Europe from perspectives offered by the latest scholarly literature. Key topics considered are circumstances under which it was possible for women to become artists, how these women evolved from artists practicing in the cloistered convent to artists participating in the competitive public market place, what they painted, and who their patrons were. Cross-listed with HISE 133 and WMST 170.

**AHS 166. Gender, Identity, and Visual Display in Washington, D.C. (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): admission to the UCR Washington Center Program. Examines the image of women and the role of women in fashioning visual culture through museums and collections in Washington, D.C. Investigates the representation of women in art; the woman artist; and women as patrons, donors, and decorators in Washington. Cross-listed with WMST 169.

**AHS 167. Europe in the Early Modern World: Global Artistic Contact and Exchange, 1492-1750 (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores

trade, religious conversion, intersecting traditions, and the creation of new traditions. Examines the mechanisms and cultural consequences of change through time.

**AHS 168. Politeness and Commerce: British Art and Design, 1660-1820 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. An introduction to the production and use of images and material culture in Britain between 1660 and 1820. Examines the role of art and design within British culture and public life.

**AHS 169. Sculpture and Its Roles in Eighteenth-Century France and Britain (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Examines the production and uses of sculpture within eighteenth-century British and French culture.

**AHS 170. Baroque Architecture (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): Art History course or consent of instructor. Examines the development of architecture in Europe and the Americas from 1580 to 1750. Explores the concept of buildings and the city as a form of communication; the spread and reformulation of architectural ideas in new contexts; and the rise of the architectural profession.

**AHS 171. The Church, the Court, and the People: Art in Seventeenth-Century Europe (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017B or AHS 017C or upper-division standing or consent of instructor. A study of the dominant trends and figures of the Italian, French, Spanish, Flemish, and Dutch Baroque, including Caravaggio, Bernini, Velazquez, and Rembrandt. Emphasis is on such issues as the development of illusionistic ceiling decoration, the theoretical basis of Baroque art, and the sacred and political uses of art.

**AHS 172. Baroque Rome (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. An in-depth examination of Roman art in the seventeenth century. Studies painting, sculpture, architecture, and urban planning in their political and religious contexts, with special emphasis on the ecclesiastical and private patrons who transformed Rome into one of the world's most important cities.

**AHS 173. Rococo to Revolution: Art in Eighteenth-Century Europe (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Examines major developments in eighteenth-century painting, sculpture, and interior decoration from the emergence of the Rococo to the dawn of Neoclassicism. Explores the response of art to new forms of patronage, the erotics of eighteenth-century art, and how art functioned as social and political commentary.

**AHS 174. Dutch Art and Culture in the Seventeenth Century (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Examines the artistic production of the Northern Netherlands in the seventeenth century, a period of exploration, invention, and growing wealth, as well as of uncertainty and war. **Neville**

**AHS 175. Industry and Alienation: Late Nineteenth-Century American Art (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): an Art History course or upper-division standing or consent of instructor. A study of American art from 1848 to 1900. Focuses on social, political, and artistic issues related to industrialization. Explores themes in visual culture; the construction of an American identity; the role of fine arts in American society; and the tensions of class, gender, race, and ethnicity in American art. **Weems**

**AHS 176. Pictorialism to New Media: A History of Twentieth-Century Photography (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. A study of photographic practices from 1900 to the present. Topics include pictorialist "art" photographs (ca.1900), the subsequent refinement of styles and content in modernism, and the expansion of photographic practices into the digital realm. Examines technological, conceptual, aesthetic, economic, and social issues.

**AHS 177. American Art: Colonial Period to 1900 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Painting and architecture in the United States from the Colonial period to 1900.

**AHS 178. The Modern City (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the modern metropolis from the Industrial Revolution to the present. Explores the history and theory of modern urbanism through case studies of metropolitan areas with a rich urban culture, architecture, and morphologic features. Investigates approaches to the problems of the large urban agglomeration in the context of social, political, and cultural conditions. Cross-listed with URST 178.

**AHS 179. Revolution, Reaction, and Revision: American Art between the World Wars (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): an Art History course or upper-division standing or consent of instructor. An in-depth study of American art and visual culture during the early twentieth century, focusing on the period between the two world wars. Traces artistic developments in painting, photography, cinema, and material culture. Explores the issues of race, class, gender, and regional identity as addressed in these media.

**AHS 180. Modern European Art I: Nineteenth Century (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Painting and sculpture in Europe from the French Revolution to the Franco-Prussian War. Introduces students to the ideas and concepts of modern European art and traces artistic developments from Neoclassicism to the emergence of Impressionism in a broad cultural, social, and political context.

**AHS 181. Modern Art II: Art in Europe, 1870-1945 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Traces the history of the modern movement from Impressionism to the end of World War II. Discussion focuses on the arts in their interrelationships to the political events and social conditions of the period and emphasizes the persecution of modernism in Europe under Fascism and Communism.

**AHS 182. Visual Art and Visual Theory after 1945 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Examines visual art since 1945 primarily from Europe and the United States, tracing developments in all media within a historical and theoretical context. Focuses on the rise of post-modernism, analyzing work in relation to theories of representation and cultural identity.

**AHS 183. Photography on Display (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers various topics related to current exhibitions at the California Museum of Photography. Provides the necessary historical and theoretical background of the specific photographs on display. Addresses the wider museum

context of the difference between working photographs, art photographs, and the politics of that designation. Course is repeatable as topics change to a maximum of 12 units.

**AHS 184. Modern Architecture (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or AHS 021/URST 021 or upper-division standing or consent of instructor. Modern architecture and its sources from 1800. Cross-listed with URST 184.

**Morton**

**AHS 185. Architectural Theory from Vitruvius to Venturi (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017A or AHS 017B or AHS 017C or AHS 021/URST 021 or upper-division standing or consent of instructor. History of architectural thought from Vitruvius to the present, with emphasis on the modern period. Surveys the major themes of architectural theory and investigates the relationships between ideas about architecture and architectural production. Cross-listed with URST 185. **Morton**

**AHS 186. Media and Movements: Film, Video, Photography, and the Visual Arts (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Focuses on key cultural movements or developments in Europe and the United States over the past century. Provides a thematic history of the avant-garde and experimental arts, including painting, sculpture, photography, video, film, performance, installation, and new media art. Cross-listed with MCS 186.

**AHS 187. Visual Culture and Art History (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017A or AHS 017B or AHS 017C or AHS 021/URST 021 or upper-division standing or consent of instructor. Examines the broader concept of visual culture as it relates to the history of the visual arts. Focuses on visuality, identity, media culture, politics, and ethics.

**AHS 188. Nineteenth-Century Photography (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Examines the development of photography in the nineteenth century. Addresses the technologies, artistic practices, and social uses of this medium. Focuses on European and American materials, as well as traces the histories of portrait, landscape, scientific, and documentary photography.

**AHS 189 (E-Z). Topics in Contemporary Art (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Addresses selected issues, movements, and artists of importance to international art history since the 1960s. E. Art since Conceptual Art. Each segment is repeatable as its topics change to a maximum of 12 units.

**AHS 190. Special Studies (1-5)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 12 units.

**AHS 192. Junior and Senior Seminar in Art History (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing in Art History. Critical study of selected topics in the history of art and its methods. Topics vary. Course is repeatable to a maximum of 12 units.

**AHS 195H. Senior Honors Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): admission to the University Honors Program or consent of the Art History Department. Independent research and preparation of a senior honors thesis completed under the supervision of a faculty member. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 8 units.

**AHS 198-I. Individual Internship (1-12)** research, variable. Prerequisite(s): consent of instructor and upper-division standing. Individual study or apprenticeship in a museum, art library, or slide and photo archive in order to gain practical experience and skills for future professional work. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

## Graduate Courses

**AHS 251P. Proseminar in Methodology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the history and methodologies of Art History. Covers the methodologies, models, and approaches of different periods from Vasari to the present. Course is repeatable as topics change.

**AHS 252. History and Ideology of the Museum (4)** Seminar, 3 hours. Prerequisite(s): AHS 251P or consent of instructor. From princely collection to public museum: a history of collecting and the evolution of the museum as a cultural institution in the western world. An investigation of sources, documents and historiography complemented by a study of museums and collections in the Los Angeles area.

**AHS 260. Seminar in Latin American Art (4)** Seminar, 3 hours; outside research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of Latin American art from the European conquest to the present. Course is repeatable as topics change.

**AHS 267. Seminar in Later Chinese Art (4)** Seminar, 3 hours; outside research, 3 hours; research paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Special topics in later Chinese art. Course is repeatable as topics change.

**AHS 272. Seminar in Medieval Art (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected issues of the function of art within medieval social, political, theological, and intellectual culture. Course is repeatable as topics change. **Rudolph**

**AHS 273. Seminar in Renaissance Art (4)** Seminar, 3 hours; outside research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Special topics in Italian and/or Northern Renaissance art. Course is repeatable as topics change.

**AHS 274. Seminar in Seventeenth- and Eighteenth-Century Art (4)** Seminar, 3 hours; outside research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Special topics in seventeenth- and eighteenth-century art. Course is repeatable as topics change. **Neville**

**AHS 276. Seminar in Nineteenth-Century Art (4)** Seminar, 3 hours; outside research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of nineteenth-century European and/or American art. Course is repeatable as topics change.

**AHS 277. Seminar in Twentieth-Century Art (4)** Seminar, 3 hours; outside research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of twentieth-century European and/or American art. Course is repeatable as topics change.

**AHS 278. Seminar in Modern Architecture (4)** Seminar, 3 hours; outside research, 3 hours; research paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of nineteenth- and twentieth-century architecture and

urbanism. Course is repeatable as topics change.

**Morton**

**AHS 279. Seminar in American Art (4)** Seminar, 3 hours; outside research, 3 hours; research paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of American art, photography, and visual/material culture from the colonial period to the present. Course is repeatable as topics change.

**AHS 280. Seminar in Research, Critical Analysis, and Thesis Writing (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers advanced research that helps in conceptualizing a thesis topic, organizing and structuring material, and in writing one chapter of the thesis. Examines research in different fields of the history of art. Explores scholarly issues from a diversity of specializations. Course is repeatable as topics change.

**AHS 282. Seminar in New Media (4)** Seminar, 3 hours; outside research, 3 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of photography, film, video, and digital media. Course is repeatable as topics change. **Rogers**

**AHS 283. Seminar in History of Photography (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history of photography, with an emphasis on new theories and histories of photographic practice. Students encouraged to do research projects drawing on the collections of the UCR/California Museum of Photography. Course is repeatable as topics change. **Kotz**

**AHS 284. Seminar in Contemporary Art and Theory (4)** Seminar, 3 hours; individual study, 3 hours; research paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Studies of selected topics in contemporary art, photography, and related media, with an emphasis on critical theories of representation and issues of practice. Course is repeatable as topics change.

**AHS 285. Getty Consortium Seminar (4) F, W, S** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An intramural seminar at the Getty Research Institute. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topics change.

**AHS 290. Directed Studies (1-6)** research, variable. Prerequisite(s): consent of instructor. Independent work under a staff member's supervision in a particular field. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**AHS 292. Concurrent Analytical Studies (1-4)** Outside research, 3-12 hours. Prerequisite(s): graduate standing and consent of instructor. To be taken concurrently with a 100-series course, but on an individual basis. It will be devoted to research, criticism, and written work of graduate order commensurate with the number of units elected. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**AHS 297. Directed Research (1-6)** research, variable. Prerequisite(s): consent of instructor, completion of language requirement and one seminar. Research study or exploratory work toward the development of the thesis. Graded Satisfactory (S) or No Credit (NC).

**AHS 298-I. Individual Internship (1-4)** research, variable. Individual study or apprenticeship in a museum, art library, or slide and photo archive in order to gain practical experience and skills for future professional work. Graded Satisfactory (S) or No Credit (NC).

Repeatable to a total of 12 units. Not more than 8 units count toward the 40 units required for the M.A.

**AHS 299. Research for Thesis (1-12)** variable hours. Prerequisite(s): consent of instructor, completion of language requirement and one seminar. Thesis research and writing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**AHS 301. Directed Studies in the Teaching of the History of Art (3)** Seminar, 2 hours; consultation, 1 hour. Prerequisite(s): graduate standing. A program of weekly meetings and individual formative evaluation required of new Art History Teaching Assistants. Covers instructional methods and classroom/section activities. Conducted by the Teaching Assistant Development Program and department faculty. Credit is not applicable toward degree unit requirements. Graded Satisfactory (S) or No Credit (NC).

**AHS 302. Teaching Practicum (1-4)** Lecture, 1-4 hours; clinic, 1 hour. Prerequisite(s): limited to departmental teaching assistants; graduate standing. Supervised teaching in upper- and lower-division Art History courses. Required of all Art History teaching assistants. Credit not applicable toward degree unit requirements. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

## Asian Studies

**Subject abbreviation: AST**

**College of Humanities, Arts, and Social Sciences**

Vivian-Lee Nyitray, Ph.D., Co-Chair  
Christina Schwenkel, Ph.D., Co-Chair  
Committee Office, 2417 Humanities  
and Social Sciences  
(951) 827-2743; [asianstudies.ucr.edu](http://asianstudies.ucr.edu)

### Committee in Charge

Muhammad Ali (Religious Studies)  
Mariam Beevi Lam (Comparative Literature & Foreign Languages)  
Lynda Bell (History)  
David Biggs (History)  
Edward Chang (Ethnic Studies)  
Lucille Chia (History)  
Piya Chatterjee (Women's Studies)  
Amanda Huffer (Religious Studies)  
Ginger Hsü (Art History)  
Kelly Jeong (Comparative Literature & Foreign Languages)  
Ruhi Khan (Media & Cultural Studies)  
Jodi Kim (Ethnic Studies)  
John Kim (Comparative Literature & Foreign Languages)  
Perry Link (Comparative Literature & Foreign Languages)  
Margherita Long (Comparative Literature & Foreign Languages)  
René Lysloff (Music)  
Hendrik Maier (Comparative Literature & Foreign Languages)  
Sally Ness (Anthropology)  
Lisa Raphals (Comparative Literature & Foreign Languages)  
Setsu Shigematsu (Media & Cultural Studies)  
Annmaria Shimabuku (Comparative Literature & Foreign Languages)  
Pashaura Singh (Religious Studies)

Priya Srinivasan (Dance)  
Yenna Wu (Comparative Literature & Foreign Languages)  
Yang Ye (Comparative Literature & Foreign Languages)  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

## Major

The Asian Studies major affords students the opportunity to study Asia from an interdisciplinary perspective, drawing on courses and faculty from various departments of the College of Humanities, Arts, and Social Sciences. Students are strongly encouraged to consider participating in the Education Abroad Program offered through the UC in various Asian locales, including China, Taiwan, Hong Kong, Japan, Vietnam, Singapore, the Philippines, India, and Korea. Students may also participate in the undergraduate intercampus exchange program, which allows any UC student to apply for study for one term at other UC campuses. Both options provide rich opportunities to participate in additional course work on Asia that may be counted toward the major.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The requirements for the B.A. degree in Asian Studies are as follows:

### East Asian Studies Option

Students who choose the East Asian Studies option must focus primarily on China, Japan, and Korea and are strongly encouraged to choose a disciplinary focus in either Art History, History, Comparative Literature and Foreign Languages, or Religious Studies. Students interested in East Asian diaspora communities are also encouraged to consider a secondary disciplinary focus in Ethnic Studies, leading to a minor in Asian American Studies. Students planning graduate work in Asian Studies are encouraged to write a senior thesis during the first or second quarter of their senior year. (This is a substantial paper based on original research; ideally, primary documents are consulted in the course of conducting the research.)

1. Lower-division requirements (12 units plus language requirement)

a) Two years of basic language instruction in either Chinese (CHN 001, CHN 002, CHN 003, CHN 004, CHN 005, CHN 006, CHN 020A, CHN 020B, CHN 090 or its equivalents); Japanese (JPN 001, JPN 002, JPN 003, JPN 004, JPN 005, JPN 006, or JPN 090 or its equivalents); or Korean (KOR 001, KOR 002, KOR 003, KOR 004, KOR 005, KOR 090 or its equivalents)

**Note** The sequences CHN 001, CHN 002, CHN 003, CHN 004; CHN 020A, CHN 020B; JPN 001, JPN 002, JPN 003, JPN 004; or KOR 001, KOR 002, KOR 003, KOR 004 may also be used to fulfill the language breadth requirement in the College of Humanities, Arts, and Social Sciences.

b) AST 045E/HIST 045E

c) At least 8 units from the following:

AST 090, AST 018/AHS 018, AST 022/MCS 022/CHN 022, AST 030/CHN 030, AST 032/JPN 032, AST 034/JPN 034, AST 040/CHN 040, AST 045F/HIST 045F, AST 046/CHN 046, AST 048/CHN 048, AST 062/CPLT 062, AST 063/CPLT 063, AST 064/MCS 049/VNM 064, AST 065/AHS 015, CPLT 029, ETST 005, ETST 005H, HIST 030, HIST 044/RLST 044, JPN 035, RLST 005, RLST 005H

2. Upper-division requirements (36 units)

a) At least 28 units from the following courses dealing with China, Japan, and Korea:

AST 190, AST 107/CHN 107/RLST 107, AST 135/CHN 135, AST 136/CHN 136, AST 140/AHS 140, AST 141/AHS 141, AST 142/CHN 142/RLST 142, AST 143/AHS 143, AST 144/AHS 144, AST 147/AHS 146, AST 148/CHN 148, AST 151/JPN 151, AST 152 (E-Z)/JPN 152 (E-Z), AST 153 (E-Z)/JPN 153 (E-Z), AST 154 (E-Z)/JPN 154 (E-Z), AST 169/MUS 169 (maximum of 4 units), AST 184/MCS 184/JPN 184, AST 185/CHN 185/MCS 169, AST 190, AST 195, CPAC 130G, CPAC 131, CHN 101A, CHN 101B, CHN 101C, CHN 104, CHN 105, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z), CHN 190, CPLT 142 (E-Z)/WMST 142 (E-Z), ECON 179, HIST 180, HIST 181, HIST 182, HIST 191W, JPN 101A, JPN 101B, JPN 101C, JPN 150/AST 150, JPN 190, RLST 103, RLST 105, RLST 106

b) At least 8 units from the following courses focused comparatively on East Asia, Europe, and Asian American:

AST 128/ANTH 128/DNCE 128/MUS 128/THEA 176, AST 190, AST 195, CPLT 141, CPLT 143/FREN 143, CPLT 144/RLST 144, ENGL 121 (E-Z) (see program chair for approval of particular segment) ETST 110 (E-Z), ETST 133, ETST 137, ETST 140, ETST 144, ETST 150, PHIL 110, POSC 130, SOC 136

**Note** A maximum of 12 units in East Asian language courses over and above those fulfilling the lower-division prerequisites are allowed in fulfilling the 36-unit requirement.

## Comparative Asian Studies Option

The option focuses on the historical interactions and cultural similarities and differences among East, Northeast, South, Southeast, West, and Central Asia peoples, including those constituting transnational and/or diaspora communities throughout the world. Students interested in Asian diaspora communities in America are encouraged to consider a secondary disciplinary focus in Ethnic Studies, leading to a minor or a second major in Asian American Studies. Students planning graduate work in Asian Studies are encouraged to write a senior thesis during the first or second quarter of their senior year. (This is a substantial paper based on original research; ideally, primary documents are consulted in the course of conducting the research, and the topic should deal with a comparative theme within Asian Studies.)

1. Lower-division requirements (12 units plus language requirement)
  - a) Two years of basic language instruction in any Asian language (This requirement may be filled by language courses currently offered at UCR such as Chinese, Japanese, or Korean, or by courses in other East, Northeast, South, Southeast, West, or Central Asian languages taken at other accredited institutions subject to the approval of the chair of the Asian Studies Committee.)
  - b) At least 12 units from the following:
 

AHS 015, AST 018/AHS 018, AST 022/MCS 022/JPN 022, AST 030/CHN 030, AST 032/JPN 032, AST 034/JPN 034, AST 040/CHN 040, AST 045 (E-Z)/HIST 045 (E-Z), AST 046/CHN 046, AST 062/CPLT 062, AST 063/CPLT 063, AST 064/MCS 049/VNM 064, AST 065, AST 090, CPLT 029, ETST 005, ETST 005H, HASS 021A, HASS 021B, HASS 021C, HIST 030, HIST 044/RLST 044, JPN 035, RLST 005, RLST 005H
2. Upper-division requirements (36 units)
  - a) At least 12 units from the following:
 

AST 127/ANTH 176/DNCE 127/ETST 172/MUS 127, AST 128/ANTH 128/DNCE 128/MUS 128/THEA 128, AST 190, AST 195, CPLT 143/FREN 143, CPLT 144/RLST 144, ENGL 121 (E-Z) (see program chair for approval of particular segment) POSC 030
  - b) Twenty-four units (24) taken from at least two or more of the following five area groupings:
    - (1) Asian America: AST 124/MUS 124, ENGL 139, ENGL 139T, ETST 106, ETST 110 (E-Z), ETST 133, ETST 137, ETST 138, ETST 139, ETST 140, ETST 143A, ETST 143B, ETST 144, ETST 150, SOC 136
    - (2) China: AST 107/CHN 107/RLST 107, AST 140/AHS 140, AST 141/AHS 141, AST 142/CHN 142/RLST 142,

AST 143/AHS 143, AST 135/CHN 135, AST 136/CHN 136, AST 148/CHN 148, AST 185/CHN 185/MCS 169, CHN 105, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z), CHN 190, HIST 180, HIST 181, HIST 182, HIST 191W, RLST 103

- (3) Japan/Korea: AST 144/AHS 144, AST 147/AHS 146, AST 151/JPN 151, AST 152 (E-Z)/JPN 152 (E-Z), AST 153 (E-Z)/JPN 153 (E-Z), AST 154 (E-Z)/JPN 154 (E-Z), AST 169/MUS 169 (4 units maximum), AST 184/MCS 184/JPN 184, CPLT 142 (E-Z)/WMST 142 (E-Z), JPN 150, JPN 190, RLST 105
- (4) Southeast Asia: ANTH 140-I, AST 127/ANTH 176/DNCE 127/ETST 172/MUS 127, AST 162/HIST 187/VNM 162, AST 163/CPLT 163, AST 165 (E-Z)/VNM 165 (E-Z)/WMST 165 (E-Z), AST 168/MUS 168 (4 units maximum), AST 170/MUS 170 (4 units maximum)
- (5) Other East, Northeast, South, Southeast, West, or Central Asia:
 

AST 128/MUS 128/DNCE 128/MUS 128/THEA 176, CPLT 144/RLST 144, PHIL 110, POSC 130, RLST 101, RLST 106, RLST 108

## Minor

The Asian Studies minor allows students from any discipline to enhance their studies with a focus on Asian peoples and cultures. The minor consists of 28 units.

1. Lower-division requirements: 8 units from the following: AHS 015, AST 018/AHS 018, AST 022/MCS 022/JPN 022, AST 030/CHN 030, AST 034/JPN 034, AST 040/CHN 040, AST 045 (E-Z)/HIST 045 (E-Z), HIST 044/RLST 04, JPN 035, RLST 005, RLST 005H
2. Upper-division requirements: 20 units from the following:
 

ANTH 140-I

AST 107/CHN 107/RLST 107, AST 124/MUS 124, AST 127/ANTH 176/DNCE 127/ETST 172/MUS 127, AST 128/ANTH 128/DNCE 128/MUS 128/THEA 176, AST 135/CHN 135, AST 136/CHN 136, AST 140/AHS 140, AST 141/AHS 141, AST 142/CHN 142/RLST 142, AST 143/AHS 143, AST 144/AHS 144, AST 147/AHS 146, AST 148/CHN 148, AST 151/JPN 151, AST 152 (E-Z)/JPN 152 (E-Z), AST 153 (E-Z)/JPN 153 (E-Z), AST 154 (E-Z)/JPN 154 (E-Z), AST 162/HIST 187/VNM 162, AST 163/CPLT 153, AST 165 (E-Z)/VNM 165 (E-Z)/WMST 165 (E-Z), AST 168/MUS 168 (no more than 2 units may be applied to the minor), AST 169/MUS 169 (no more than 2 units may be applied to the minor),

AST 170/MUS 170 (no more than 2 units may be applied to the minor), AST 184/MCS 184/JPN 184, AST 185/CHN 185/MCS 169, AST 190 (no more than 4 units may be applied to the minor)

CHN 101A, CHN 101B, CHN 101C, CHN 104, CHN 105, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z), CHN 190, CPLT 141, CPLT 143, CPLT 142 (E-Z)/WMST 142 (E-Z), CPLT 144/RLST 144, ECON 179, ENGL 139, ENGL 139T, ETST 133, ETST 137, ETST 138, ETST 140, ETST 143A, ETST 144, ETST 150, HIST 180, HIST 181, HIST 182, HIST 191W, JPN 101A, JPN 101B, JPN 101C, JPN 150, JPN 190, PHIL 110, POSC 130, RLST 101, RLST 103, RLST 105, RLST 106, RLST 108

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Lower-Division Courses

**AST 018. Introduction to Writing and Painting in China (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): none. An introduction to Chinese calligraphy and painting, focusing on their development in history and their practice in Chinese society. Topics include the development of writing technique and style, the integration of writing and painting, and the world around the Chinese artist. Cross-listed with AHS 018.

**AST 022. Introduction to Japanese Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to Japan's major directors and to watching and writing about Japanese film. Works studied range from the samurai epics of Kurosawa to recent anime. All films have subtitles. No previous knowledge of Japanese language or culture is required. Cross-listed with JPN 022 and MCS 022.

**AST 023. Modern Japan and Personal Narrative (4)** Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Introduces major debates in history, politics, and culture through the genres of biography, autobiography, diary, and confession. Explores the parallel construction of the modern nation, the modern language, and the modern self. Traces the development of Japan's "I-novel." Builds skills in close reading by studying the rhetoric of self-narrative. Cross-listed with CPLT 023 and JPN 023.

**AST 030. Introduction to Chinese Civilization (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introduction to Chinese civilization through an interplay of philosophical, historical, religious, and literary readings from the ancient times through the modern age. Uses audiovisual media. All work is in English. Cross-listed with CHN 030.

**AST 032. Introduction to Japanese Folklore (4)** Lecture, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): none. Focuses on narrative genres of myth, legend, and folktale, with additional attention paid to festivals, folk craft, belief systems, and the development of folklore studies (*minzokugaku*) as an academic discipline. Examines the relationship of folklore to ethnic and national identity. Cross-listed with JPN 032.

**AST 034. Early Japanese Civilization (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. An introduction to Japanese civilization from earliest times to the dawn of the twentieth century. Devotes particular attention to aesthetic activity and to the relationship between history, culture, and the arts. Cross-listed with JPN 034.

**AST 040. Masterworks of Chinese Literature (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. Reading and discussion of selected great works of Chinese literature (in English translation) with attention to cultural contexts. Various critical methods and approaches are used. Cross-listed with CHN 040.

**AST 045 (E-Z). Topics in Asian History (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): none. An introduction to regional histories and cultures of Asia. E. Premodern China and Japan; F. Contemporary China; G. India in the Western Imagination. Cross-listed with HIST 045 (E-Z).

**AST 046. Responses to Political Repression in Modern Chinese Literature and Film (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An examination of the various responses to political repression in China during the second half of the twentieth century through selected literary and artistic representations. Cross-listed with CHN 046.

**AST 047. Introduction to Korean Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the major directors and films of Korea. Covers the genres and periods of works produced from the 1960s to the present. All films have English subtitles. No previous knowledge of Korean language or culture required. Cross-listed with KOR 047 and MCS 047.

**AST 048. Chinese Cinema (4)** Lecture, 2 hours; discussion, 1 hour; screening, 2 hours; outside research, 1 hour. Prerequisite(s): none. Study of selected films from China and Taiwan with attention to cultural context. Questions addressed may include the following: What do we look for in a film? What are the film's interrelations with theatre, photography, and literature? How do we understand the film as an art form? Cross-listed with CHN 048.

**AST 049. Introduction to Southeast Asian History (4)** Lecture, 3 hours; extra reading, 3 hours. Introduces major themes and events in Southeast Asian history. Covers from prehistory to contemporary events in the region. Develops basic historical approaches to understanding contemporary trends, such as the spread of world religions, regional differences and connections, trading patterns, cultural forms, and historically important sites. Cross-listed with HIST 046 and SEAS 047.

**AST 056. Cultures of the Japanese Empire (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the social histories and literatures of the Japanese Empire from the foundation of the Meiji state to the present. Includes the Ainu, Okinawan, Taiwanese, and Korean cultures. Explores the concepts of assimilation, citizenship, national language, nation-state, sovereignty, total war, and translation. Utilizes readings in English. Cross-listed with CPLT 056 and JPN 056.

**AST 062. Introduction to Southeast Asian Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to modern and contemporary Southeast Asian literature and culture, with a focus on individual national histories. Explores the relationship between aesthetics, politics, and academic scholarship. Readings are in translation; classes are conducted in English. Cross-listed with CPLT 062.

**AST 063. Reading Southeast Asian Stories (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to the modern short story in Southeast Asia, with a focus on literariness and the act of reading. Readings are in translation; classes are conducted in English. Course is repeatable as content changes to a maximum of 8 units. Cross-listed with CPLT 063.

**AST 064. Introduction to Vietnamese and Diasporic Film Culture (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Engages students in critical viewing strategies and analytical visual critique. Explores the revival of film production in Vietnam following the Vietnam War, with a focus on the means of production, state control, and international distribution. Readings are in translation; classes are conducted in English. Cross-listed with MCS 049 and VNM 064.

**AST 065. Introduction to Southeast Asian Cultures (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to the world of Southeast Asia, with an emphasis on aspects of local cultures.

**AST 090. Special Studies (1-5)** Individual study, 3-15 hours. To be taken with the consent of the Chair of the Program as a means of meeting special curricular problems. Course is repeatable.

## Upper-Division Courses

**AST 107. Taoist Traditions (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AST 030/CHN 030 or upper-division standing or consent of instructor. A survey of the ancient mystical and philosophical aspects of Taoism as well as the living religious tradition, their relationships to each other, and their expression in Chinese culture and civilization. Topics include the Tao Te Ching, the *Chuang-tzu*, the Taoist canon, meditation, immortality, alchemy, and ritual. Cross-listed with CHN 107 and RLST 107.

**AST 112. Modern Korean Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of modern Korean literature from the colonial era to the present. Topics include colonialism; cultural influence and exchange; gender, family and sexuality; nation and nationalism; Confucian tradition and patriarchal culture; and modernization and capitalism. Cross-listed with KOR 112.

**AST 123. Southeast Asian Performance (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed both as a time-honored and as a contemporary medium for cultural production, from the courts to everyday experience. Material will be drawn from the Philippines, Malaysia, Indonesia, Thailand, Laos, Cambodia, Vietnam, Burma, Singapore, and the Southeast Asian diaspora. Cross-listed with ANTH 126, DNCE 123, and MUS 123.

**AST 124. Music of Asian America (4)** Lecture, 3 hours; music listening, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores music as a window on the cultural politics of Asian America. Examines expressive culture as a constitutive site for ethnic identities and emergent political formations. Covers musics of Asian immigrants and of subsequent generations, including Asian American jazz and hip-hop. Cross-listed with MUS 124.

**AST 126. Southeast Asia, Prehistory to 1800 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers the major Southeast Asian historical periods and cultures. Includes prehistory, classical kingdoms, and early modern trading states. Considers the role of ancient stories, religious systems, technologies, and art forms in forming traditional Southeast Asian identities, as well as the influences on these identities from outside the region. Cross-listed with HIST 185 and SEAS 185.

**AST 127. Music Cultures of Southeast Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with ANTH 176, DNCE 127, ETST 172, and MUS 127.

**AST 128. Performing Arts of Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in four major geocultural regions of Asia: Central, East, South and Southeast. No Western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with ANTH 128, DNCE 128, MUS 128, and THEA 176.

**AST 129. Modern Southeast Asia, 1800 to Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the formation of modern Southeast Asian nations and cultures since 1800. Compares colonial and postcolonial experiences in the region. Studies the formation of nationalist movements and the relationship of nationalist history with traditional and local histories. Considers the role of the individual, modern media, and global trade in the near-present. Cross-listed with HIST 186 and SEAS 186.

**AST 131. Readings in the Origins of Science in China and Greece (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the ancient scientific traditions of China and Greece and compares to modern scientific categories. Includes ideas about nature, the body, and systematic accounts of the natural world. Cross-listed with CHN 131, CLA 131, and CPAC 131.

**AST 132. Medical Traditions in China and Greece (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative examination of the early development of Western medical traditions in classical Greece and the origins and development of the Chinese medical systems now referred to as traditional Chinese medicine, with specific attention to their cultural and social contexts. Cross-listed with CHN 132, CLA 132, and CPAC 132.

**AST 133. Buddhist Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Readings in canonical and non-canonical Buddhist texts. Includes Buddhist-influenced literature written by Asian, European, and American authors. Examines themes of emptiness, impermanence, and no-self. Cross-listed with CPLT 144 and RLST 144.

**AST 135. Great Novels of China (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the social, philosophical, and aesthetic features in major Ming-Qing novels through critical reading and analysis of literature in translation. No knowledge of Chinese required. Cross-listed with CHN 135.

**AST 136. Family and Gender in the Chinese Short Story (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines a broad array of short stories from the Tang to the Qing dynasties (approximately ninth to eighteenth century). Investigates love, marriage, family, gender dynamics, and the representation of women in Chinese literature. No knowledge of Chinese required. Cross-listed with CHN 136.

**AST 140. Chinese Painting of the Song and Yuan Dynasties (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. The history of early Chinese painting, from the beginning to the fourteenth century, with concentration on the Song and Yuan dynasties (A.D. 960-1367). The development of themes, subjects, styles, theories, and purposes discussed in their cultural and historical contexts. Cross-listed with AHS 140.

**AST 141. Chinese Painting of the Ming and Qing Dynasties (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 015 or equivalent or upper-division standing or consent of instructor. The history of later Chinese painting (from the fourteenth to the eighteenth century). Investigates new pictorial genres, art theories, political environment, popular taste, and the changing social role of the artist. Cross-listed with AHS 141.

**AST 142. Chuang-tzu (4)** Lecture, 1 hour; discussion, 2 hours; outside research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): RLST 005 or RLST 005H or AST 107/CHN 107/RLST 107 or consent of instructor. An examination of chaos, epistemological and linguistic relativism, fate, skill, and the character of the sage in perhaps the most significant of Chinese Taoist texts, the *Chuang-tzu*. Discussion of the structure and style of this literary masterpiece. Students with knowledge of classical Chinese may arrange additional work through special studies. Cross-listed with CHN 142 and RLST 142.

**AST 143. Text and Image in Chinese Painting (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. Examines the art of writing and painting in China, focusing on the close relationship between written language and pictorial image. Reading knowledge of the Chinese language is not necessary. Cross-listed with AHS 143.

**AST 144. Japanese Painting: Twelfth to Nineteenth Century (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. Major developments in the pictorial art of Japan from the twelfth to the nineteenth century. Emphasis on the social and cultural contexts of painting, pictorial genres, and pivotal artists and styles. Cross-listed with AHS 144.

**AST 145. Militarism and Hegemony in the Ancient World (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with CHN 141, CLA 141, CPAC 141, and POSC 140.

**AST 147. The Japanese House (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. History of the traditional Japanese house from prehistoric times to the nineteenth century. Examples used to place the Japanese house within the general history of Japanese architecture and within its social and cultural context. Cross-listed with AHS 146.

**AST 148. Chinese Poetry and Poetics in Translation (4)** Lecture, 2 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examination of traditional Chinese poetry through the study of selected major texts, emphasizing forms, themes, and Chinese poetics in its close relation to the development of Chinese literature. Classes are conducted in English. Cross-listed with CHN 148.

**AST 150. In Women's Hands: Reading Japanese Women Writers (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines major works of Japanese women writers from Heian (ninth century) to contemporary, focusing on themes, genres, representations of gender, ideas of love and romance, and feminine aesthetics. Readings include fiction, poetry, essays, and drama, with the main emphasis on fictional writing. Classes are conducted in English. Cross-listed with JPN 150.

**AST 151. Early Japanese Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An in-depth introduction to early Japanese literature. Focuses on fiction, from early poem tales and court romances to warrior tales and stories of the floating world. Careful attention is given to the works' historical and cultural backgrounds and visual and artistic dimensions. All works are read in English translation. Course is repeatable as content changes. Cross-listed with JPN 151.

**AST 152 (E-Z). Themes in Modern Japanese Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to modern Japanese literature in translation, as seen through the lens of a particular theme or issue. All materials read or viewed in English. E. The End of the World in Japanese Literature; F. The Mask in Japanese Fiction; G. Love and Death; J. Classics and Canon; K. Dreams and Other Virtual Worlds. Cross-listed with JPN 152 (E-Z).

**AST 153 (E-Z). Themes in Early Japanese Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to early Japanese literature, as seen through the lens of a particular theme or issue. All works are read in English translation. E. Supernatural Japan; F. Warrior Japan; G. The Culture of the Floating World: Tokugawa Period Literature, Drama, and Art. Cross-listed with JPN 153 (E-Z).

**AST 154 (E-Z). Themes in the Folklore and Popular Culture of Japan (4)** Lecture, 2 hours; discussion, 1 hour; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include myth, legend, folktale, folk performance, festival, ritual, and the development of popular or commercial culture. Considers literary versus oral tradition, ethnic identity, authenticity, nationalism, modernity, commodification, and the invention of tradition. E. Ancient Myth to Contemporary Legend: A Study of Japanese Folk Narrative; F. History of Japanese Popular Culture. Cross-listed with JPN 154 (E-Z).

**AST 160. The Vietnam Wars (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Vietnamese history in the twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-*doi moi* society. Cross-listed with HIST 184, SEAS 184, and VNM 184.

**AST 161. Translating Modern Southeast Asian Texts (4)** Lecture, 3 hours; term paper, 1.5 hours; written work, 1.5 hours. Prerequisite(s): upper-division standing; knowledge of one Southeast Asian language is recommended. An introduction to translating modern Southeast Asian texts into English. Presents translations of texts from Vietnam, Indonesia, and the Philippines in a context of theory. Materials are in English. Course is repeatable as content changes.

**AST 162. Vietnamese Literary History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with HIST 187, SEAS 162, and VNM 162.

**AST 163. Nationalism and the Novel (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the novel and its role within nationalism as a representative summary or mirror of the nation. Cross-listed with CPLT 163.

**AST 164. Vietnamese American Culture (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the pervasive aspects of Vietnamese American culture, including shared histories, acculturation patterns, class diversity, identity struggles, community-building literary and cultural production, youth issues, and cultural survival. Introduces foundational literature, visual culture, and scholarship in the field. Cross-listed with VNM 164.

**AST 165 (E-Z). Themes in Vietnamese Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An exploration of Vietnamese literature in translation, as seen through the lens of a particular theme or issue. Segments pay particular attention to the implications of gender and sexuality on nation formation. All materials are read or viewed in English. E. Women and War. Cross-listed with VNM 165 (E-Z) and WMST 165 (E-Z).

**AST 166. Vietnam and the Philippines (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the comparative national histories of Vietnam and the Philippines by way of great literary works in various genres: poetry, short fiction, and novels. All materials are read in English. Cross-listed with CPLT 166 and VNM 166.

**AST 167. Postcolonial Literature and Criticism in Southeast Asia and South Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how the theoretical concepts of postcolonial criticism inform and challenge the literature of Southeast Asia and South Asia, as the literature itself pushes the limits of the criticism. Addresses themes of nation, identity, space, gender, home, diaspora, alterity, history, sexuality, transnationalism, neocolonialism, tourism, and education. Cross-listed with CPLT 167.

**AST 168. Javanese Gamelan Ensemble: Beginning (2)** Prerequisite(s): upper-division standing and consent of instructor. Study and performance of the Central Javanese gamelan, consisting mainly of gongs and gong-chime instruments. Readings and discussions focus on Javanese culture. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with MUS 168.

**AST 169. Taiko Ensemble (1)** Studio, 2 hours.

Prerequisite(s): upper-division standing or consent of instructor. Study and performance of Japanese drumming. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with MUS 169.

**AST 170. Rondalla Ensemble (1-2)** Studio, 2-4 hours.

Prerequisite(s): upper-division standing or consent of instructor. Study and performance of the Filipino rondalla, an ensemble consisting of various sizes of lute-like and guitar-like instruments. Discussions focus on Filipino culture. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with MUS 170.

**AST 184. Japanese Media and Cultural Studies (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates Japanese media and culture including film, television, video games, *manga* (comics), *anime*, music, and print and digital media. Analyzes the function of media relating to issues of national identity, imperial culture, collective memory, and censorship. Includes transnational circulation of Japanese cultural forms, alternative media, and historical changes in technologies. Cross-listed with JPN 184 and MCS 184.

**AST 185. New Chinese Cinema (4)** Lecture, 3 hours;

screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of representative films from the People's Republic of China, with a focus on those made during the last decade. Conducted in English; most films have English subtitles. Cross-listed with CHN 185 and MCS 169.

**AST 186. Hong Kong Cinema: Gender, Genre, and the "New Wave" (4)** Lecture, 3 hours; screening, 3 hours.

Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Examines contemporary Hong Kong films, specifically the "New Wave" genre. Particular focus is on the sociopolitical conditions of Hong Kong and its relations with Great Britain and China, the linkages of which set the stage for the films and thematic concerns. Cross-listed with MCS 168.

**AST 187. Vietnamese and Overseas Vietnamese Cinema (4)** Lecture, 3 hours; screening, 3 hours.

Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores how Vietnamese people and the Vietnamese diaspora seek to imagine a sense of community in the postwar era through contemporary film and video. Examines the thematics of return, longing, and exile. Reviews some of the texts' bold expressions of gender, sexuality, and identity. Cross-listed with MCS 167.

**AST 188 (E-Z). Topics in Chinese History (4)** Lecture, 3

hours; extra reading, 3 hours. Prerequisite(s): upper-division standing; HIST 180 or HIST 181 or HIST 182; or consent of instructor. An in-depth look at important topics in Chinese history. E. Chinese Food Culture; F. Four Great Inventions of Imperial China. Cross-listed with HIST 188 (E-Z).

**AST 189. Encountering Vietnam (5)** Lecture, 6 hours;

tutorial, 6 hours; project, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on literary and historical accounts of Vietnam. Utilizes translated travel writings from different genres and eras. Proficiency in Vietnamese not required. Taught in Vietnam and offered only in summer. Cross-listed with HIST 189, SEAS 189, and VNM 189.

**AST 190. Special Studies (1-5)** Individual study, 3-15

hours. Prerequisite(s): upper-division standing or consent of instructor. To be taken with the consent of the Chair of the Program as a means of meeting special curricular problems. Course is repeatable.

**AST 195. Senior Thesis (1-4)** Thesis, 3-12 hours.

Prerequisite(s): consent of instructor and senior standing. Preparation of a substantial paper based on original research. The student works independently with a faculty member. Course is repeatable to a maximum of 12 units.

## Biochemistry

**Subject abbreviation: BCH**  
**College of Natural and Agricultural Sciences**

Richard J. Debus, Ph.D., Chair  
Department Office, 2323 Webber Hall  
Graduate Program (951) 827-5093  
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**Professors**

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Craig V. Byus, Ph.D.  
(Biochemistry/Biomedical Sciences)  
Richard J. Debus, Ph.D.  
Daniel R. Gallie, Ph.D.  
Russ Hille, Ph.D.  
Xuan Liu, M.D., Ph.D.  
Stephen R. Spindler, Ph.D.  
Jolinda A. Traugh, Ph.D.

**Professors Emeriti**

Michael F. Dunn, Ph.D.  
Helen L. Henry, Ph.D.  
Darold D. Holten, Ph.D.  
Richard A. Luben, Ph.D. (Biochemistry/  
Biomedical Sciences)  
Anthony W. Norman, Ph.D. (Biochemistry/  
Biomedical Sciences)  
Ning G. Poon, Ph.D.  
Justin K.M. Roberts, Ph.D.

**Associate Professors**

Paul B. Larsen, Ph.D.  
Ernest Martinez, Ph.D.  
Frank Sauer, Ph.D.

**Assistant Professors**

Li Fan, Ph.D.  
Noboru Sato, Ph.D.  
Laura Zanello, Ph.D.

**Senior Lecturer**

Miriam Ziegler, Ph.D. \*\*

**Affiliated Emeritus**

Irving L. Eaks, Ph.D.

**Cooperating Faculty**

Michael E. Adams, Ph.D. (Entomology/Cell Biology  
and Neuroscience)  
Peter Atkinson, Ph.D. (Biomedical Sciences)  
Jeffrey Bachant, Ph.D. (Cell Biology &  
Neurosciences)  
Julia Bailey-Serres, Ph.D. (Botany and Plant  
Sciences)  
Katherine A. Borkovich, Ph.D. (Plant Pathology  
and Microbiology)  
Kathryn DeFea, Ph.D. (Biomedical Sciences)  
Iryna Ethell, Ph.D. (Biomedical Sciences)  
Karine Gaele Le Roch, Ph.D. (Cell Biology &  
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Sarjeet Gill, Ph.D. (Biomedical Sciences)  
Hailing Jin, Ph.D. (Plant Pathology and

Microbiology)

Edward Korzus, Ph.D. (Psychology)  
Cynthia K. Larive, Ph.D. (Chemistry)  
Manuela Martins-Green, Ph.D. (Cell Biology &  
Neurosciences)  
Thomas H. Morton, Ph.D. (Chemistry)  
Leonard Mueller, Ph.D. (Chemistry)  
Eugene Nothnagel, Ph.D. (Biomedical Sciences)  
Constance Nugent, Ph.D. (Cell Biology &  
Neurosciences)  
Alexander Raikhel, Ph.D. (Entomology)  
Anandasankar Ray, Ph.D. (Entomology)  
Schiller, Neal, Ph.D. (Biomedical Sciences)  
John Shyy, Ph.D. (Biomedical Sciences)  
Frances Sladek, Ph.D. (Cell Biology &  
Neurosciences)  
Christopher Y. Switzer, Ph.D. (Chemistry)  
Vullev, Valentine I., Ph.D. (Bioengineering)  
Emma Wilson, Ph.D. (Biomedical Sciences)  
Raphael Zidovetzki, Ph.D. (Cell Biology &  
Neurosciences)

## Major

The three emphases areas within the Biochemistry major are Chemistry, Biology, and Medical Sciences. The Biology and Chemistry emphases are for students interested in post-graduate education or employment in the basic areas of the discipline of Biochemistry. The goal of the Medical Sciences emphasis is to prepare students for admission to postbaccalaureate education in the health professions. The Biology, Chemistry, and Medical Sciences emphases focus on the development of laboratory and critical thinking skills, and hands-on laboratory experience. In addition, participation in an independent research project (BCH 197) or research tutorial (BCH 190), carried out under the supervision of a faculty member, is encouraged. Internships in industry (BCH 198-I) are also available, and often lead to valuable job experience and employment opportunities.

The department offers both B.A. and B.S. degrees. The major and emphasis requirements are the same for both, and most students choose the B.S. degree. The B.A. degree requires 12 additional units of Humanities and Social Sciences courses, and 16 units or a course 4 equivalency level of a foreign language (see College Breadth Requirements).

**Note** A maximum of 12 units of 190-199 courses may be counted toward the 180 unit graduation requirement. All courses used towards the Biochemistry major requirements must be taken for letter grades.

## Transfer Students

Transfer students majoring in Biochemistry must complete at least three of the following full-year sequences, which must include first-year calculus and general chemistry:

1. First-year calculus, equivalent to MATH 009A, MATH 009B, MATH 0046
2. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C
3. Organic chemistry (must be completed with

a minimum grade of "B" in each term)

4. General biology, equivalent to BIOL 005A, BIOL 05LA, and BIOL 005B (and BIOL 005C, if available)
5. General physics (calculus-based) equivalent to PHYS 002A, PHYS 002B, PHYS 002C or PHYS 040A, PHYS 040B, PHYS 040C

Students must have a minimum grade point average of 2.70 in transferable college courses.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

## Major Requirements

1. The major requirements and the emphasis requirements are the same for the B.A. and the B.S. degree in Biochemistry. Choose one emphasis. All upper-division courses presume completion of the life sciences core curriculum.

1a. Continuation in the major requires that the student maintains cumulative and upper division/science GPAs of 2.00 or higher, a GPA of 2.00 or higher in each academic quarter, and makes adequate progress in the major with no more than 16 units of repeated courses.

Adequate progress in the major is defined as (a) earning no grade lower than a "C-" in any required lower division mathematics or science course, STAT 100A, CHEM 112A, CHEM 112B, CHEM 112C, or any upper division BCH course, and (b) completing MATH 9B and CHEM 1A by the end of the Fall Quarter of the second year of residence and BCH 110A, BCH 110B, and BCH 110C by the end of the third year of residence. Freshmen must also complete BCH 95 with a grade of "S" during their first year of residence. Freshmen in the Medical Science Emphasis must also complete BCH 96 with a grade of "S" during their first year of residence. A student who does not meet these adequate progress standards will be discontinued from the major. In addition, a student who receives a grade of "D+" or lower in any two of the courses in (A) on the first attempt, or in any one of these courses in each of two attempts, will be discontinued from the major. Students who receive a grade lower than "B-" in BIOL 5A or CHEM 112A are strongly encouraged to complete BCH 100 during their second year of residence to better prepare themselves for BCH 110A, BCH 110B, and BCH 110C.

## Biology Emphasis

1. Lower-division requirements (56-57 units)
  - a) BCH 095 or equivalent
  - b) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - c) CHEM 001A, CHEM 001B, CHEM 001C,

CHEM 011A, CHEM 011B, CHEM 011C

- d) MATH 008B or MATH 009A, MATH 009B, MATH 046
- e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC
2. Statistics requirement (5 units): STAT 100A
3. Upper-division requirements (59–65 units)
  - a) BCH 101, BCH 102, BCH 110A, BCH 110B, BCH 110C, BCH 184
  - b) At least 7 units from BCH 120, BCH 153/BIOL 153/BPSC 153, BCH 162, BCH 180A, BCH 180B, BCH 180C, BCH 183/BPSC 183, BCH 186, BCH 187, BCH 210, BCH 211, BCH 212
  - c) BIOL 102
  - d) CHEM 109 or CHEM 110A; CHEM 112A, CHEM 112B, CHEM 112C
  - e) Choose three biological science courses from the following:
    - (1) BCH 120, BCH 153/BIOL 153/BPSC 153, BCH 162, BCH 180A, BCH 180B, BCH 180C, BCH 183/BPSC 183, BCH 186, BCH 187, BCH 210, BCH 211, BCH 212
    - (2) BIOL 105, BIOL 108, BIOL 114, BIOL 117, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 128/CBNS 128, BIOL 151, BIOL 155/BPSC 155, BIOL 157, BIOL 159/NEM 159, BIOL 160, BIOL 161A, BIOL 161B, BIOL 171, BIOL 171L, BIOL 173/ENTM 173, BIOL 175
    - (3) BIOL 104/BPSC 104, BIOL 132/BPSC 132, BIOL 143/BPSC 143, BIOL 148/BPSC 148, BIOL 155/BPSC 155, BPSC 135
    - (4) BIOL 100/ENTM 100, BIOL 173/ENTM 173, ENTM 128
    - (5) CBNS 101, CBNS 106, CBNS 116, CBNS 120/PSYC 120, CBNS 120L/PSYC 120L, CBNS 124/PSYC 124, CBNS 125/PSYC 125, CBNS 150/ENTX 150, CBNS 169
    - (6) ENSC 100, ENSC 155
    - (7) ENTX 101, CBNS 150/ENTX 150
4. BCH 190 or BCH 197 are available as elective courses to juniors who have completed BCH 102 and to seniors. No more than 9 units of courses numbered 190-199 may be counted towards the major.

## Chemistry Emphasis

1. Lower-division requirements (61-62 units)
  - a) BCH 095 or equivalent
  - b) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - c) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C, CHEM 005
  - d) MATH 008B or MATH 009A,

MATH 009B, MATH 046

- e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC
2. Statistics requirement (5 units): STAT 100A
3. Upper-division requirements (58–59 units)
  - a) BCH 101, BCH 102, BCH 110A, BCH 110B, BCH 110C, BCH 184
  - b) At least 7 units from BCH 120, BCH 153/BIOL 153/BPSC 153, BCH 162, BCH 180A, BCH 180B, BCH 180C, BCH 183/BPSC 183, BCH 186, BCH 187, BCH 210, BCH 211, BCH 212
  - c) BIOL 102
  - d) CHEM 109 or CHEM 110A; CHEM 112A, CHEM 112B, CHEM 112C
  - e) Two courses from CHEM 110B, CHEM 113, CHEM 125, CHEM 150A, CHEM 150B, CHEM 166 (Other graduate courses may be substituted by students with a GPA of 3.00 or better with permission of the instructor and the faculty advisor.)
4. BCH 190 or BCH 197 are available as elective courses to juniors who have completed BCH 102 and to seniors. No more than 9 units of courses numbered 190-199 may be counted towards the major.

## Medical Sciences Emphasis

1. Lower-division requirements (54-55 units)
  - a) BCH 095 or equivalent
  - b) BCH 096, BCH 098-I
  - c) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - d) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C
  - e) MATH 008B or MATH 009A, MATH 009B
  - f) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC
2. Statistics requirement (5 units): STAT 100A
3. Upper-division requirements (59 units)
  - a) BCH 101, BCH 102, BCH 110A, BCH 110B, BCH 110C, BCH 120, BCH 184
  - b) BIOL 102
  - c) CHEM 109 or CHEM 110A; CHEM 112A, CHEM 112B, CHEM 112C
  - d) CBNS 101
  - e) At least 8 units from BIOL 121, BIOL 161A, BIOL 161B, BIOL 171, CBNS 106, CBNS 150.

Graduate and upper-division courses can be substituted with permission of the instructor and the faculty advisor. Graduate courses require a GPA of 3.0 or greater in the sciences.

Students should be aware that CHEM 005 is often a requirement for admission to professional schools.



**BCH 120. Topics in Human Biochemistry (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100 with a grade of "C+" or better or BCH 110B with a grade of "C-" or better or consent of instructor. Lectures on biochemical and molecular aspects of modern endocrinology, nutrition, metabolic diseases, and blood chemistry. Emphasis is on relation of the above topics to medicine. The discussion sections are used for presentations on topical medical problems.

**BCH 153. Plant Genomics and Biotechnology**

**Laboratory (4)** Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BCH 110C or BIOL 107A; upper-division standing; consent of instructor. A study of modern techniques in plant genome modification. Topics include nucleic acid cloning and sequencing; plant tissue culture and genetic transformation; controlled-environment plant growth; gene mapping; and germplasm collections. Also explores the history of plant biotechnology; economic, agricultural, nutritional, medicinal, and societal relevance; and regulatory issues. Cross-listed with BIOL 153 and BPSC 153.

**BCH 162. Biochemistry and Molecular Biology**

**Laboratory (5)** Lecture, 1 hour; discussion, 1 hour; laboratory, two 4.5-hour laboratories. Prerequisite(s): BCH 102; BCH 110A, BCH 110B, BCH 110C all with grades of "C+" or better (BCH 110C may be taken concurrently); consent of instructor. Purification, quantitation, and analysis of DNA, RNA, protein, and lipid. Molecular techniques include DNA cloning, *in situ* hybridization, restriction mapping, PCR, and DNA sequencing. Biochemical techniques include *in vitro* transcription and translation, immunochromatography, phase extraction, affinity chromatography, and gel shift assays.

**BCH 180A. Methods in Gene Regulation (2)** Lecture, 1 hour; seminar, 1 hour; extra reading, 2 hours; term paper, .5 hours. Prerequisite(s): upper-division standing, concurrent enrollment in BCH 197 or equivalent or BCH 110C or BIOL 107A; or consent of instructor. Introduction and discussion of experimental approaches and modern techniques in the study of gene regulation in eukaryotes.

**BCH 180B. Methods in Chromatin Research (2)**

Lecture, 1 hour; seminar, 1 hour; term paper, .5 hours; extra reading, 2 hours. Prerequisite(s): upper-division standing, concurrent enrollment in BCH 197 or equivalent or BCH 110C with grade of "C-" or better or BIOL 107A with grade of "C-" or better; or consent of instructor. An introduction and discussion of the experiments and methods in studying DNA-dependent processes in the context of chromatin.

**BCH 180C. Methods in Cell Signaling (2)** Lecture, 1 hour; seminar, 1 hour; extra reading, 2 hours; term paper, 5 hours. Prerequisite(s): upper-division standing, concurrent enrollment in BCH 197 or equivalent or BCH 110C or BIOL 107A; or consent of instructor. Introduction and discussion of the experimental approaches and modern techniques in the study of cell growth regulation, signal transduction, and cell death in cancer.

**BCH 183. Plant Biochemistry (3)** Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B; or BCH 100; or consent of instructor. The course is designed for the student interested in plant biochemistry who wishes to become informed about biochemical structures, systems and metabolic pathways which are unique to plants; for example, photosynthesis, nitrogen fixation, cell walls, and seed development and germination. Cross-listed with BPSC 183.

**BCH 184. Topics in Physical Biochemistry (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100 with a grade of "C-" or better or BCH 110A with a grade of "C-" or better; BIEN 135 or CHEM 109 or CHEM 110A; or consent of instructor. Explores modern biophysical methods determining the structures of biological macromolecules and relating structure to function. Covers x-ray crystallography, NMR, and cryoelectron microscopy. Addresses imaging and mass spectrometry for determining structure and ultraviolet, visible, infrared, RAMAN, fluorescence, NMR, EPR, and other forms of spectroscopy for relating macromolecular structure to function.

**BCH 186. Topics in Molecular Bioenergetics (3)** Lecture, 3 hours. Prerequisite(s): BCH 100 with a grade of "C-" or better or BCH 110B with a grade of "C-" or better; BCH 184 with a grade of "C-" or better; or consent of instructor. Introduction to biological energy transduction. Describes the coupling of oxidative phosphorylation and photosynthesis to adenosine triphosphate (ATP) synthesis and the coupling of ATP hydrolysis to ion transport, chemotaxis, molecular motors, biomimetics, and other biological processes on the basis of recent structural and mechanistic studies of the protein complexes involved.

**BCH 187. Fundamentals of Enzymology (3)** Lecture, 3 hours. Prerequisite(s): BCH 100 or BCH 110A with a grade of C- or better. An introduction to the fundamental principles of enzymology. Specific topics include, acid-base catalysis, strain effects, transition state theory, enzyme kinetics (including isotope effects), enzyme dynamics and enzyme regulation. Considers in detail the reactions of several representative enzymes.

**BCH 188. Introduction to Oral Presentations (2)**

Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): upper-division standing; consent of instructor. Prepares science students for oral presentations and formal research talks. Includes student presentations and discussions. Also covers the electronic preparation of figures and tables.

**BCH 189. Reading and Analysis of Scientific**

**Articles (1)** Lecture, 1 hour. Prerequisite(s): junior or senior standing or consent of instructor. Introduces students to the analysis of scientific articles. Students read current research papers, present the data, and learn to critique papers.

**BCH 190. Special Studies (2-4)** Individual study, 6-16 hours. Prerequisite(s): upper-division standing and consent of instructor. Literature review and tutorial in select modern biochemical topics. Course is repeatable.

**BCH 197. Research for Undergraduate Students (1-4)**

Prerequisite(s): junior status and consent of the instructor. Directed research and preparation of written report. Course is repeatable.

**BCH 198-I. Internship in Biochemistry (1-12)**

Internship, 3-36 hours. Prerequisite(s): BCH 102, consent of instructor, upper-division standing. An internship to provide students with on-the-job biochemical experience in government, industrial or clinical laboratories. Each individual project must be approved by the Biochemistry Department and the laboratory director where the internship is to be carried out. A written report is required. Graded Satisfactory (S) or No Credit (NC). May be repeated for a total of 12 units.

## Graduate Courses

**BCH 204. Genome Maintenance and Stability (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 113 or BIOL 114 or CBNS 101; BIOL 102 is strongly recommended. Emphasizes chromosome-based processes that maintain genome integrity and ensure accurate genome transmission during cell division. Topics are drawn from the primary literature and include chromatin structure and composition, DNA repair and recombination, telomere function and chromosome maintenance, mitotic chromosome segregation, and checkpoint surveillance mechanisms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 204 and ENTX 204.

**BCH 205. Signal Transduction Pathways in Microbes and Plants (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in the biological sciences, BIOL 107A or BIOL 113 or BIOL 114 or CBNS 101; or consent of instructor. Advanced topics in signal transduction pathways that regulate growth and development in plants and prokaryotic and eukaryotic microbes. Areas covered include two-component regulatory systems; quorum sensing; signaling via small and heterotrimeric G proteins; mitogen-activated protein kinase cascades; cAMP signaling; photoreceptors; plant hormone signaling; responses to low-oxygen stress; calcium signaling; and plant pathogenesis. Cross-listed with BPSC 205, CMDB 205, GEN 205, MCBL 205, and PLPA 205.

**BCH 210. Biochemistry of Macromolecules (4)** Lecture, 4 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; BCH 184 (may be taken concurrently); CHEM 109; graduate standing or consent of instructor. Discussion of recent advances in the knowledge of the molecular architecture of proteins and nucleic acids, especially with respect to new experimental approaches for analyzing their structure and function. Chemistry of the active site of enzymes.

**BCH 211. Molecular Biology (3)** Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; graduate standing or consent of instructor. Advanced topics in molecular biology of the biosynthesis and regulation of DNA, RNA, and proteins. Some topics covered include the following: molecular anatomy of genes and chromosomes; DNA repair and recombination; regulation of genes in the cell cycle; telomerase; RNA processing and splicing; RNA editing; regulation of normal genes and oncogenes; chaperones and protein targeting.

**BCH 212. Signal Transduction and Biochemical Regulation (3)** Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; graduate standing or consent of instructor. Advanced topics in signal transduction and biochemical regulation. Topics include protein kinases and protein phosphorylation; phosphatases and their role in regulation; function of phosphorylation events in regulation of metabolism and growth; calcium and other ion channels as signal transduction mechanisms; steroid hormones receptor super family; immune system signal transduction events.

**BCH 230 (E-Z). Advanced Topics in Biochemistry (2)**

Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): BCH 100 or both BCH 110A and BCH 110B or consent of instructor. Addresses advances in a particular field of biochemistry by analysis of the recent literature. E. Structure of Biological Molecules; F. Enzyme Catalysis; G. Glycobiology; H. Membrane Biochemistry; I. Cytoskeleton and Extracellular Matrix; J. Metabolism; K. Regulation of Chromatin Structure and Transcription; M. Genome Stability; N. Regulation of Protein Synthesis; O. Signal Transduction; Q. Cell Cycle Regulation; R. Biochemistry of Stress Responses; S. Biochemistry of Development and Aging; T. Molecular Basis of Genetic Diseases; U. Genomics and Proteomics; V. Emerging Topics in Biochemistry and Molecular Biology; W. Stem Cell Biology.

**BCH 231. The Plant Genome (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 107A; or BCH 110A, BCH 110B, BCH 110C; or consent of instructor. Gives students an appreciation for the structure of the plant nuclear, chloroplast, and mitochondrial genomes. Gene structure, regulation of gene expression, transposons, and methods of gene introduction are also emphasized. Cross-listed with BPSC 231.

**BCH 240. Special Topics in Biochemistry (2)** Lecture, 2 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents (may be taken concurrently); graduate standing in Biochemistry or consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of specialization of each faculty member. Course content emphasizes recent advances in the special topic area and varies accordingly. Transposable Elements and Insect Molecular Biology. **Atkinson**. Chromosome Segregation and Stability. **Bachant**. Mechanisms of Translational Control. **Bailey-Serres**. Signal Transduction in Fungi. **Borkovich**. Biochemical Pharmacology. **Byus**. Photosynthesis: Electron Transfer and O<sub>2</sub> Evolution. **Debus**. Specificity in Mitogen-Activated Kinase Cascades. **DeFea**. Molecular Basis of Learning and Memory. **Ethell, I.** Crystal Structure & Function Proteins. **Fan, L.** Plant Gene Expression. **Gallie**. Enzyme Kinetics. **Hille, R.** Mechanisms of Signal Transduction in Plants. **Larsen**. Tumor Suppressor and Cell Cycle Regulation. **Liu**. Regulation of Eukaryotic Gene Transcription. **Martinez**. Chemokines in Healing and Disease. **Martins-Green**. Mechanisms of Steroid Hormones. **Norman**. Insect Innate Immunity. **Raikhel, A.** Stem Cell Biology. **Sato**. Chromatin. **Sauer**. Regulation of Tissue-Specific Gene Expression. **Sladek**. Regulation of Gene Expression. **Spindler**. Signal Transduction. **Traugh**. Ion Channels. **Zanello, L.** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BCH 250. Oral Presentations in Biochemistry (2)** Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing. Training and practice in the presentation of biochemical concepts in both short and long seminar formats, using blackboard, overhead projector, and slides. Presentations are immediately and critically evaluated by both faculty and staff. Limited to 10 students.

**BCH 251. Graduate Seminar in Biochemistry (2)** Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): BCH 250. Oral reports by graduate students on current research topics in biochemistry.

**BCH 252. General Seminar in Biochemistry (1)** Seminar, 1 hour. Prerequisite(s): graduate standing. Oral reports by faculty, graduate students, and visiting scholars on current research topics in biochemistry. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BCH 261. Seminar in Genetics, Genomics, and Bioinformatics (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BIOL 261, BPCS 261, ENTM 261, GEN 261, and PLPA 261.

**BCH 264. Seminar-Tutorial in Physical Biochemistry (2)** Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): BCH 210 or consent of instructor. Oral reports and discussions by visiting scholars and faculty on current research topics in the area of physical biochemistry.

**BCH 289. Special Topics in Neuroscience (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BIOL 289, CHEM 289, ENTM 289, NRSC 289, and PSYC 289.

**BCH 290. Directed Studies (1-4)** Outside research, 3-12 hours. Prerequisite(s): graduate standing in Biochemistry; consent of instructor and graduate advisor. Experimental or literature studies on specifically selected topics undertaken under the direction of a staff member. With prior approval of the graduate advisor, M.S. students may be assigned a letter grade; other students are graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BCH 291. Individual Study in Biochemistry (1-6)** Prerequisite(s): graduate standing in Biochemistry or consent of instructor. A program of studies designed to advise and assist candidates who are preparing for examinations. Open to M.S. and Ph.D. candidates; does not count toward the unit requirement for the M.S. degree. Graded Satisfactory (S) or No Credit (NC). Repeatable up to 6 units for pre-Master's students and up to 12 units for Ph.D. students prior to successful completion of the qualifying examination.

**BCH 297. Directed Research (1-6)** Prerequisite(s): graduate status in Biochemistry or consent of instructor. Directed research in preparation for dissertation projects performed prior to advancement to candidacy. Graded Satisfactory (S) or No Credit (NC).

**BCH 299. Research for Thesis or Dissertation (1-12)** Prerequisite(s): graduate status in Biochemistry or consent of instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**BCH 301. Teaching of Biochemistry at the College Level (1)** Seminar, 1 hour. Prerequisite(s): graduate standing and consent of instructor. A program of weekly meetings and individual formative evaluations required of new biochemistry teaching assistants. Covers instructional methods and classroom/section activities most suitable for teaching Biochemistry. Conducted by the TA Development Program. Credit not applicable to graduate unit requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BCH 302. Apprentice Teaching (1-4)** variable hours. Prerequisite(s): graduate standing; limited to departmental teaching assistants. Supervised teaching in lower- and upper-division Biochemistry courses. Required for all Biochemistry teaching assistants. Fulfills portion of the teaching requirements for Ph.D. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

## Bioengineering

**Subject abbreviation: BIEN**  
**The Marlan and Rosemary Bourns**  
**College of Engineering**

Jerome S. Schultz, Ph.D., Chair  
 Department Office, A220 Bourns Hall  
 (951) 827-4303; [www.bioeng.ucr.edu](http://www.bioeng.ucr.edu)

### Professors

Bahman Anvari, Ph.D.  
 Dimitrios Morikis, Ph.D.  
 Victor G. J. Rodgers, D.Sc.  
 Jerome S. Schultz, Ph.D., *Distinguished Professor*

### Assistant Professors

Kaustabh Ghosh, Ph.D.  
 Jiayu Liao, Ph.D.  
 Huinan Liu, Ph.D.  
 Julia Lyubovitsky, Ph.D.

Jin Nam, Ph.D.  
 Boris Hyle Park, Ph.D.  
 Valentine Vullev, Ph.D.

\*\*

### Adjunct Professors

Paul Citron, Ph.D.  
 Shuh Wei Sun, Ph.D.

## Major

The major in Bioengineering allows students to complete a B.S. degree that provides a basic education to enter the fields of bioengineering and biotechnology.

Bioengineering is rooted in physics, mathematics, chemistry, biology, and the life sciences. It is the application of a systematic, quantitative, and integrative way of thinking about and approaching the solutions of problems important to biology, health, and clinical practice.

Bioengineers develop processes and products that are important for health and treatment of diseases, new materials, protecting environments, and food production. They are employed by the pharmaceutical, biotechnology, medical device, and environmental and food industries. For students interested in medicine, the bioengineering program provides the basic courses to prepare for application to medical schools.

The objective of the bioengineering program is to produce graduates who:

- have a strong foundation to apply science, engineering, and biological principles to meet the challenges at the interface of engineering, life sciences, and medicine
- have the capability to pursue graduate studies, careers in the medical device or biotechnology industries, or entry into medical or other health related professional schools
- are effective as professionals working individually and in teams and can communicate effectively to integrate contributions from multiple disciplines to address biological and medical problems.
- have an appreciation of and sensitivity to a broad range of ethical and social concerns related to bioengineering

All undergraduates in the College of Engineering must see an advisor at least annually. Visit [student.engr.ucr.edu](http://student.engr.ucr.edu) for details.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Bioengineering major uses the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. BIOL 005A, BIOL 05LA
2. CHEM 001A, CHEM 001B, CHEM 001C
3. MATH 008B or MATH 009A

## Major Requirements

1. Lower-division requirements (72 units)
  - a) BIEN 010
  - b) BIOL 005A, BIOL 05LA, BIOL 005B
  - c) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
  - d) CS 010
  - e) EE 001A, EE 01LA
  - f) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
  - g) PHYS 040A, PHYS 040B, PHYS 040C
2. Upper-division requirements (80 units)
  - a) BCH 100
  - b) BIEN 105, BIEN 110, BIEN 120, BIEN 125, BIEN 130, BIEN 130L, BIEN 135, BIEN 140A/CEE 140A, BIEN 155, BIEN 159/CEE 159, BIEN 175A, BIEN 175B
  - c) BIEN 115
  - d) CHEM 112A, CHEM 112B, CHEM 112C
  - e) STAT 155
  - f) Technical electives (16 units): BIEN 140B, BIEN 160, BIEN 165, BIEN 197 (4 units maximum), CEE 135, CHE 105\*, CHE 122, CHE 161\*, EE 100A, EE 100B, EE 105, EE 110A, EE 110B, EE 138, EE 139, EE 143, EE 144, EE 146\*, EE 152\*, ENVE 133, ENVE 142, ENVE 171, ME 114, ME 138, ME 153, ME 180 (\*require consent of instructor prior to enrollment.)

Visit the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu) for a sample program.

## Lower-Division Course

**BIEN 010. Overview of Bioengineering (2)** Lecture, 1 hour; laboratory, 3 hours. Provides an overview of the various aspects of bioengineering. Illustrates the application of engineering principles for the design of various products and processes related to the health science industries. Covers diagnostic instruments, artificial organs, biotechnology, and cell and tissue engineering. Designed for both engineering and non-engineering majors.

## Upper-Division Courses

**BIEN 105. Circulation Physiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005B, MATH 046, PHYS 040A. Introduces tensor and vector mathematics that describe the conservation of momentum and mass transport in biological sciences, the cardiovascular system, and pulmonary system. Includes constitutive equations such as the Navier-Stokes and Casson models, significance of fluid stress in biological vessels, and the physiological relevance of fundamental parameters. Emphasizes the relation between function and system behavior.

**BIEN 110. Biomechanics of the Human Body (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C or CHEM 01HC, MATH 010A, PHYS 040B. Introduces the motion, structure and function of the musculoskeletal system, the cardiovascular system, and the pulmonary system. Topics include

applied statics, kinematics, and dynamics of these systems and the mechanics of various tissues (ligament, bone, heart, blood vessels, lung). Emphasis is on the relation between function and material properties of these tissues.

**BIEN 115. Quantitative Physiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 110; enrollment priority is given to Bioengineering majors; consent of instructor is required for nonmajors. Analyzes engineering aspects of physiological systems and artificial organs. Covers the nervous system, muscular system, cardiovascular system, respiratory system, and renal system. Addresses ethical and professional considerations in the development and utilization of medical devices and interventions. **Anvari**

**BIEN 120. Biosystems and Signal Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005B, CS 010, MATH 046, PHYS 040C. Provides basic knowledge for the quantitative analysis of the dynamic behavior of biological systems. Particular applications include neural systems, control of metabolic and hormonal systems, and design of instruments for monitoring and controlling biological systems. Topics include system theory, signal properties, control theory, and transfer functions.

**BIEN 125. Biotechnology and Molecular Bioengineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100. Provides an overview of biochemical processes in cells and their use in developing new products and processes. Presents cellular processes such as metabolism, protein synthesis, enzyme behavior, and cell signaling and control from an engineering viewpoint of modeling and control.

**BIEN 130. Bioinstrumentation (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 120; concurrent enrollment in BIEN 130L. Introduces basic components of instruments for biological applications. Explores sources of signals and physical principles governing the design and operation of instrumentation systems used in medicine and physiological research. Topics include data acquisition and characterization; signal-to-noise concepts and safety analysis; and interaction of instrument and environment. **Anvari**

**BIEN 130L. Bioinstrumentation Laboratory (2)** Laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in BIEN 130. Laboratory experience with instrumental methods of measuring biological systems. Introduces various sensors and transducers to measure physical, chemical, and biological properties. Covers reliability, dynamic behavior, and data analysis. **Anvari**

**BIEN 135. Biophysics and Biothermodynamics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, MATH 010B, MATH 046, PHYS 040C. An introduction to the application of thermodynamic principles to understanding the behavior of biological systems. Discusses biophysical properties of biomacromolecules, such as proteins, polynucleotides, carbohydrates, and lipids, and methods of characterizing their properties and interactions.

**BIEN 140A. Biomaterials (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, CHEM 112C, MATH 010B, PHYS 040B. Covers the principles of materials science and engineering, with attention to topics in bioengineering. Explores atomic structures, hard treatment, fundamentals of corrosion, manufacturing processes, and characterization of materials. Cross-listed with CEE 140A.

**BIEN 140B. Biomaterials (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 140A/CEE 140A. Covers the structure-property relations of metals, ceramics, polymers, and composites, as well as hard

and soft tissues such as bone, teeth, cartilage, ligament, skin, muscle, and vasculature. Focuses on behavior of materials in the physiological environment. Cross-listed with CEE 140B.

**BIEN 155. Biotechnology Laboratory (2)** Laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, PHYS 040C. Laboratory experience in cell culture, bioreactors, optical techniques, array techniques, and separation and purification methods.

**BIEN 159. Dynamics of Biological Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100 or BCH 110A. Covers engineering principles for the analysis and modeling of biological phenomena. Topics include molecular diffusion and transport, membranes, ligand-bioreceptor interactions, enzyme kinetics, and dynamics of metabolic pathways. Examines the application of these principles to the design of bioreactors, bioassays, drug delivery systems, and artificial organs. Cross-listed with CEE 159.

**BIEN 160. Biomedical Imaging (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 120. An introduction to the fundamental physics and engineering principles for medical imaging systems. Covers X-ray, ultrasound, radionuclide, magnetic resonance imaging, positron emission tomography, optical coherent tomography, and other optical methods. Includes image formation and reconstruction, image characteristics, and quality and image processing. **Schultz**

**BIEN 165. Biomolecular Engineering (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): BIEN 125; PHYS 040B or consent of instructor. Emphasizes engineering, biochemical, and biophysical concepts and technologies intrinsic to specific topics of biomolecular engineering. Introduces the history of genetic and protein engineering. Topics include biological thermodynamics, molecular kinetics, biochemical and biophysical approaches, protein engineering, high-throughput screening technologies, and protein engineering with unnatural amino acids. **Liao**

**BIEN 175A. Senior Design (4)** Lecture, 2 hours; practicum, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 130; BIEN 130L; BIEN 135; senior standing in Bioengineering. Preparation of formal engineering reports and statistical analysis on a series of problems illustrating methodology from various branches of applied bioengineering. Covers the entire design process: design problem definition, generation of a design specification, documentation, design review process, prototype fabrication, testing and calibration, cost estimation, and federal guidelines. Requires a term project and oral presentation. Graded In Progress (IP) until BIEN 175A and BIEN 175B are completed, at which time a final, letter grade is assigned.

**BIEN 175B. Senior Design (4)** Lecture, 1 hour; practicum, 6 hours; discussion, 1 hour. Prerequisite(s): BIEN 175A; senior standing in Bioengineering. Preparation of formal engineering reports and statistical analysis on a series of problems illustrating methodology from various branches of applied bioengineering. Covers the entire design process: design problem definition, generation of a design specification, documentation, design review process, prototype fabrication, testing and calibration, cost estimation, and federal guidelines. Requires a term project and oral presentation. Satisfactory (S) or No Credit (NC) grading is not available.

**BIEN 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing; consent of instructor and department chair. Provides individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

**BIEN 197. Research for Undergraduates (1-4)**

Laboratory, 3-12 hours. Prerequisite(s): consent of instructor and Bioengineering undergraduate program advisor. Directed research on a topic relevant to bioengineering. Requires a final written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Graduate Courses

**BIEN 220. Chemical Genomics Design Studio (2)**

Lecture, 1 hour; practicum, 4 hours. Prerequisite(s): Course work in cell biology, genetics, combinatorial chemistry; or consent of instructor; graduate standing. Explores chemical genomic research approaches. Emphasizes critical thinking; advanced planning of time-consuming tests of hypotheses and experimental caveats, trade-offs, and options. Taught in a case-study approach, teams consist of students with engineering, biology, computational sciences, and chemical backgrounds. Teams generate an interdisciplinary chemical genomic research project. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 220.

**BIEN 223. Engineering Analysis of Physiological Systems (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): course work in basic biology, calculus, chemistry, and physics; graduate standing or consent of instructor. Provides a bioengineering approach to the physiological properties and interactions of various mammalian organ systems. Covers the nervous, muscular, cardiovascular, respiratory, and renal systems. Emphasizes the physical and engineering principles governing these systems by applying quantitative and analytical approaches. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. **Anvari**

**BIEN 224. Cellular and Molecular Engineering (4)**

Lecture, 2 hours; discussion, 1 hour; practicum, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Emphasizes biophysical and engineering concepts intrinsic to specific topics at the cellular and molecular level. Includes receptor-ligand dynamics in cell signaling and function; DNA replication and RNA processing; cellular and protein sorting; control of gene expression; membrane structure, transport and traffic; biological signal transduction; and mechanics of cell division. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 246.

**BIEN 227. Biophotonics: Laser-Tissue Interactions and Therapeutic Applications (3)**

Lecture, 2 hours; extra reading, 1 hour; written work, 1.5 hours. Prerequisite(s): BIOL 005C, CHEM 001C, CS 005, MATH 046, PHYS 002C, or equivalents. Provides an overview of various types of interactions between lasers and biological tissues. Addresses methods of optical properties measurements, mathematical modeling of light propagation, and selected therapeutic applications of lasers. Includes one or two field trips to medical laser centers to observe laser treatment procedures.

**BIEN 228. Biophotonics: Optical Diagnosis and Measurements (3)**

Lecture, 2 hours; outside research, .5 hours; extra reading, 1 hour; written work, 1.5 hours. Prerequisite(s): BIEN 227. Covers the fundamentals underlying optical diagnostic procedures, including absorption and scattering-based techniques. Also addresses physics of optical tweezers and their applications in biological sciences.

**BIEN 233. Computational Modeling of Biomolecules (4)**

Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): BIOL 005B; CHEM 112B; MATH 009C or MATH 09HC; PHYS 040B; basic computer programming

experience. Introduces computational methods for the quantitative analysis of biomolecular structures at atomic resolution. Aids in understanding the physico-chemical properties of biomolecular function, the prediction of biological properties, and the design of new experiments. Forms the basis for structure-based design of proteins with tailored properties and inhibitors of protein function. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**BIEN 245. Optical Methods in Biology, Chemistry, and Engineering (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 109 or equivalent; graduate standing; consent of instructor. Covers the origin of fluorescence and other emission processes that modulate the characteristics of molecular emissions. Presents emission-based analytical and bioanalytical methods and techniques. Reviews state-of-the-art instrumentation, including their applicability, limitations, and source. Also provides interpretation and meaning of the measured signals as applied to biological systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes. Cross-listed with MSE 226.

**BIEN 249. Integration of Computational and Experimental Biology (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B; MATH 009B or MATH 09HB; graduate standing. Multidisciplinary introduction to the mathematical concepts of design of experiments, information content, causation versus correlation, and statistical analysis with respect to hypothesis testing, model development, and parameter estimation. Covers state-of-the-art experimental techniques in proteomics, transcriptomics, metabolomics, and genetics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CEE 249.

**BIEN 251. Biophotonics: Optical Microscopy and Its Biological Applications (3) S, F, W**

Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the fundamentals of optical system design and system integration in light microscopy. Covers design components, including light sources, lenses, mirrors, dispersion elements, optical fibers, and detectors. Also covers optical system analysis, transfer functions, magnification, resolution, contrast, and molecular, cellular, organ, and organism applications. **Lyubovitsky**

**BIEN 260. Special Topics in Bioinstrumentation (1 or 2)**

Seminar, 1 hour; term paper, 0-3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced technologies in bioengineering studies, such as spectroscopy, microscopy, magnetic resonance imaging, computed tomography, ultrasonography, and biosensors. Students who submit a term paper receive credit for 2 units; other students receive credit for 1 unit. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**BIEN 261. Special Topics in Biotransport (1 or 2)**

Seminar, 1 hour; term paper, 0-3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced methods of analysis of biological transport phenomena such as drug distribution, microcirculation, membrane transport, and transport in organs and tissues. Students who submit a term paper receive credit for 2 units; other students receive credit for 1 unit. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**BIEN 262. Special Topics in Biosignaling (1 or 2)**

Seminar, 1 hour; term paper, 0-3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on current research in cell signaling and control, including G protein-coupled receptors, signal transduction and cytoskeletal dynamics, and cell adhesion and cell metabolism. Students who submit a term paper receive credit for 2 units; other students receive credit for 1 unit. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**BIEN 263. Special Topics in Biocomputation (1 or 2)**

Seminar, 1 hour; term paper, 0-3 hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on various advanced methods for computational studies of biomolecules and simulations. Includes Brownian dynamics simulations; Monte Carlo methods; normal mode analysis; electrostatic calculations; and free energy calculations. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**BIEN 264. Biotransport Phenomena (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 105 or equivalent; graduate standing or consent of instructor. Covers the mathematical expression and modeling of principles underlying the transport processes of biological systems and biomedical engineering processes. Emphasizes momentum, mass transport, and interpretation of these processes. Topics include advanced development of governing conservation equations and the appropriate constitutive equations for transport in circulation and tissue. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**BIEN 265. Special Topics in Biomedical Optical Imaging (1 or 2) S**

Seminar, 1 hour; term paper, 0-3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced theory, technology, and applications of biomedical optical imaging. Addresses novel sources of optical contrast, current developments in optical imaging instrumentation, and recent advances in their application to bioengineering. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Schultz in charge**

**BIEN 266. Special Topics in Biological Nuclear Magnetic Resonance (NMR) Spectroscopy (1 or 2)**

Seminar, 1 hour; term paper, 0-3 hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on various advanced methods for the determination of structure, dynamics, and interactions of biomolecules. Utilizes multidimensional and multinuclear NMR spectroscopy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**BIEN 267. Special Topics in Biophotonics (1 or 2)**

Seminar, 1 hour; term paper, 0-3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced science and technology methods that use electromagnetic radiation for medical and biological applications. Covers photonic devices, detection, microscopy and spectroscopy techniques, and diagnostics and mechanistic ideas on photodynamic therapy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Lyubovitsky**

**BIEN 268. Bioengineering Experimentation and Analysis (2)**

Laboratory, 3 hours; discussion, 1 hour; written work, 2 hours. Prerequisite(s): BIOL 005C,

CHEM 001C, CS 005, MATH 046, PHYS 002C or equivalents or consent of instructor. Introduces measurement principles and data acquisition methods related to biomechanics and biochemical and bioelectrical signals from living systems. Addresses the fundamental mechanisms underlying the operation of various sensor types and the modern instruments illustrating noise analysis, filtering, signal processing, and conditioning. Includes experiments aimed at investigating physical responses of cells and tissues to a variety of stimuli.

**BIEN 269. Special Topics in Optical Measurements and Photomedicine (2)** Discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the applications of optical trapping methods to characterize the mechanical and electromechanical properties of biological cells and membranes, as well as to quantify molecular interactions. Also covers the use of optical probes for cellular and tissue imaging, as well as optical therapy. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes. **Anvari**

**BIEN 270. Transport with Reactions in Biological Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 264 or equivalent; graduate standing or consent of instructor. Covers the mathematical expression and modeling of principles underlying the transport processes of biological systems reactions and biomedical engineering processes involving reactions. Topics include advanced development of chemical kinetics and reaction mechanisms of biological systems; enzymatic reactions; Michaelis-Menton kinetics; and cell-surface ligand-receptor kinetics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. **Rodgers**

**BIEN 271. Video Bioinformatics: Multi-scale Analysis of Biological Systems (2)** Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the significant range for both the time and spatial scales of biological systems. Includes video imaging techniques, as well as how these spatial and time scales are analyzed for a better understanding of biological function. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 271.

**BIEN 286. Colloquium in Bioengineering (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Colloquia on current research topics in bioengineering and other related fields. Presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BIEN 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Faculty-directed individual study of selected topics in Bioengineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

**BIEN 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Provides research opportunities for selected problems in bioengineering. Conducted under faculty supervision. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

**BIEN 298-I. Individual Internship (1-12)** Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): graduate standing; consent of instructor. An individual apprenticeship in bioengineering with an approved professional individual or organization and academic work under the direction of a faculty member. Requires a written report. Graded Satisfactory (S) or

No Credit (NC). Course is repeatable to a maximum of 16 units.

**BIEN 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. Designated for research in bioengineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**BIEN 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): graduate standing; appointment as a teaching assistant or associate in Bioengineering. Provides supervised teaching in undergraduate courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

# Bioengineering Interdepartmental Graduate Program

Victor G. J. Rodgers, D.Sc., Chair  
Department Office, A237 Bourns Hall  
(951) 827-6241; vrodgers@engr.ucr.edu

## Faculty

### Distinguished Professors

Robert C. Haddon, Ph.D. (Chemistry)  
Natasha Raikhel, Ph.D. (Botany & Plant Sciences)  
Jerome S. Schultz, Ph.D. (Bioengineering)

### Professors

Michael E. Adams, Ph.D. (Cell Biology & Neuroscience/Entomology)  
Bahman Anvari, Ph.D. (Bioengineering)  
G. John Andersen, Ph.D. (Psychology)  
Bir Bhanu, Ph.D. (Electrical Engineering)  
David Bocian, Ph.D. (Chemistry)  
Quan Cheng, Ph.D. (Chemistry)  
Wilfred Chen, Ph.D. (Chemical & Environmental Engineering)  
Sarjeet S. Gill, Ph.D. (Cell Biology & Neuroscience/Entomology)  
Tao Jiang, Ph.D. (Computer Science)  
David Johnson, Ph.D. (Biomedical Sciences)  
Cynthia K. Larive, Ph.D. (Chemistry)  
David Lo, Ph.D. (Biomedical Sciences)  
Elizabeth Lord, Ph.D. (Botany & Plant Sciences)  
Manuela Martins-Green, Ph.D. (Cell Biology & Neuroscience)  
Umar Mohideen, Ph.D. (Physics & Astronomy)  
Dimitrios Morikis, Ph.D. (Bioengineering)  
Thomas H. Morton, Ph.D. (Chemistry)  
Ashok Mulchandani, Ph.D. (Chemical & Environmental Engineering)  
Nosang Myung, Ph.D. (Chemical & Environmental Engineering)  
Eugene Nothnagel, Ph.D. (Botany & Plant Sciences)  
Cengiz S. Ozkan, Ph.D. (Mechanical Engineering)  
Mihri Ozkan, Ph.D. (Electrical Engineering)  
Victor G. J. Rodgers, D.Sc. (Bioengineering)  
John Shyy, Ph.D. (Biomedical Sciences)  
Thomas F. Stahovich, Ph.D. (Mechanical Engineering)  
Prudence Talbot, Ph.D. (Cell Biology and Neuroscience)  
Harry W. K. Tom, Ph.D. (Physics & Astronomy)  
Kambiz Vafai, Ph.D. (Mechanical Engineering)  
Yushan Yan, Ph.D. (Chemical & Environmental

Engineering)

### Associate Professors

Guillermo Aguilar, Ph.D. (Mechanical Engineering)  
Christopher J. Bardeen, Ph.D. (Chemistry)  
Sean Cutler, Ph.D. (Plant Cell Biology and Chemistry)  
Thomas Girke, Ph.D. (Bioinformatics)  
Stefano Lonardi, Ph.D. (Computer Science)  
Michael Marsella, Ph.D. (Chemistry)  
Jianzhong Wu, Ph.D. (Chemical & Environmental Engineering)  
Sharon Walker, Ph.D. (Chemical & Environmental Engineering)

### Assistant Professors

Anupama Dahanukar, Ph.D. (Entomology)  
Elisa Franco, Ph.D. (Mechanical Engineering)  
Kastaubh Ghosh, Ph.D. (Bioengineering)  
Jiayu Liao, Ph.D. (Bioengineering)  
Huinana Liu, Ph.D. (Bioengineering)  
Julia Lyubovitsky, Ph.D. (Bioengineering)  
Jin Nam, Ph.D. (Bioengineering)  
B. Hyle Park, Ph.D. (Bioengineering)  
Masaru P. Rao, Ph.D. (Mechanical Engineering)  
Khalefi A. Razak, Ph.D., (Psychology)  
Valentine Vullev, Ph.D. (Bioengineering)  
Nicole I. Zur Nieden, Ph.D. (Cell Biology and Neuroscience)

### Adjunct Professor

Shu-Weisun, Loma Linda University

## Program Overview

The Bioengineering Interdepartmental Graduate program (BIG) is the umbrella for graduate level research effort associated with the faculty in the Department of Bioengineering as well as other faculty at UCR who have an interest in training graduate students in bioengineering. The program offers graduate instruction leading to M.S. and Ph.D. degrees in Bioengineering.

Our interdisciplinary program combines a solid fundamental foundation in biological science and engineering, and aims to equip the students with diverse communication skills and training in the most advanced quantitative bioengineering research so that they can become leaders in their respective fields. The result is a rigorous, but exceptionally interactive and welcoming educational training for Bioengineering graduate students.

The interdepartmental aspect of the program allows students to develop skills related to bioengineering with faculty in a broad range of disciplines. The research vision is to build strength from experts in biochemistry, biophysics, biology and engineering to focus on critical themes that impact bioengineering.

Contributing departments include: Bioengineering, Biochemistry, Biomedical Sciences, Botany & Plant Sciences, Cell Biology & Neuroscience, Chemistry, Chemical & Environmental Engineering, Computer Science, Electrical Engineering, Entomology, Mechanical Engineering, Physics & Astronomy, and Psychology.

The dominant research themes of BIG are advanced techniques development, bioimaging, biophysics of cellular systems, biomaterials, drug design and delivery, tissue engineer-

ing, cellular control and regulation, and computational modeling of biological systems.

Other research areas include: high-throughput screening systems, structural bioinformatics, microfluidics, charge transfer in biological and biomimetic systems, immunophysics, auditory bioengineering, molecular mechanisms of platelets activation, fatty acid contributions to obesity and diabetes, brain imaging, and bioseparations.

Please visit the UCR website to determine the research emphasis of the various participating faculty. The research efforts of faculty in the Department of Bioengineering can be found at [www.bioeng.ucr.edu](http://www.bioeng.ucr.edu).

**Combined B.S. + M.S. Five-Year Program** The college offers a combined B.S. + M.S. program in Bioengineering designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, a combined SAT Reasoning score above 1950 (or ACT plus Writing equivalent), complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

**Admission** In addition to the following requirements, all applicants must meet the general requirements as set forth in this catalog under the Graduate Studies section.

Applicants will need to have completed coursework in chemistry, physics, math, biochemistry and biology, and engineering. Students without an undergraduate engineering degree should have excellent training in mathematics and the physical sciences.

Specific recommendations for students without an undergraduate engineering degree are:

- Two years of mathematics (equivalent UCR course = Math 9A-C, Math 10A,B)
- One year of physics (equivalent UCR course = Phys 2 A-C with lab)
- One year of inorganic chemistry including lab (equivalent UCR course = Chem 1A-C)
- One year of organic chemistry including lab (equivalent UCR course = Chem 112 A-C).
- One course in biochemistry (equivalent UCR course = BCH 100 or BCH 110A or B or C).
- One course in molecular biology (equivalent UCR course = BCH 110C or Biol 107).

Students with strong academic records may be admitted with limited coursework deficiencies, provided that these are satisfied by appropriate coursework taken during the first two years of graduate study.

**Language Requirement** All International students whose first language is not English must satis-

factorily complete the SPEAK test.

Students may be admitted to either the Master's or the Ph.D. program. Students in the Master's program may petition for admission into the Ph.D. program.

## Master's Program

The M.S. program is ideal for professionals seeking greater depth in several areas of bioengineering. The degree requires a minimum of 36 quarter credits and may be completed in three to four academic quarters of full-time study. Both thesis and non-thesis options are offered for the degree program (Plan I, Thesis and Plan II, Comprehensive Examination).

Student must request permission to pursue an M.S. in Bioengineering while simultaneously pursuing a Ph.D. in a program other than Bioengineering.

### Normative Time to Degree

Two years.

### Plan I (Thesis)

In addition to the following requirements, all applicants must meet the requirements for Plan I as set forth in this catalog under the Graduate Studies section Master's Degree Plan I (Thesis).

**Course Requirements** Students must satisfy the core course requirements (see Core Courses). Students must enroll in BIEN 286, Colloquium in Bioengineering, each quarter it is offered.

### Plan II (Comprehensive Examination)

This plan is designed primarily for students who do not intend to pursue a Ph.D. in Bioengineering.

In addition to the following requirements, all applicants must meet the requirements for Plan I as set forth in this catalog under the Graduate Studies section Master's Degree Plan II (Comprehensive Examination).

**Course Requirements** Students must satisfy the core course requirements (see Core Courses). Students must enroll in BIEN 286, Colloquium in Bioengineering, each quarter it is offered.

The comprehensive examination is prepared and administered by the Graduate Examination Committee. The student is allowed to choose between an oral and a written examination. The examination covers a broad range of topics chosen from upper division undergraduate courses and graduate courses taken by M.S. students.

Subsequent to the examination, the Graduate Examination Committee issues a passing or failing grade. Students who fail in the first attempt may retake the examination at the next scheduled comprehensive examination period. No more than two attempts to pass the exam are allowed.

The M.S. Comprehensive Examination may be held at the end of any quarters throughout the

year. The committee to administer the M.S. Comprehensive Examination is selected by the Graduate Advisor and approved by the Graduate Program Committee.

## Doctoral Program

The Ph.D. program is heavily integrated with research activities and is intended for well-qualified individuals who wish to pursue leadership careers in academic or industrial research. The Ph.D. program requires approximately three years of full-time study beyond the master's degree. In consultation with a faculty advisor, Ph.D. students plan their program of study. The doctoral dissertation is based on original research in the field of specialization. An M.S. degree is not a prerequisite for entering the Ph.D. program.

The doctoral program includes a teaching requirement, an oral and written qualifying examination, and a dissertation.

**Normative Time to Degree** Five years.

**Course Requirements** Students must satisfy the core course requirements (see Core Courses). Students must enroll in BIEN 286, Colloquium in Bioengineering, each quarter it is offered.

**Written Qualifying Examination** Students in the Ph.D. program must pass a written qualifying examination that covers the fields of engineering and biology that relate to the student's dissertation project.

**Oral Qualifying Examination** Following successful completion of the written examination, candidates for the doctoral degree must pass an oral examination, normally within three quarters of the date of their written exam. The oral examination is scheduled only after the candidate has written a proposal detailing the rationale, specific aims and approaches to be undertaken for her/his dissertation research.

**Dissertation** A written dissertation is completed by each student.

Candidates for the degree of Ph.D. may be required to defend the dissertation in a public, oral presentation at a time announced to members of the University community.

**Core Courses** All BIG graduate students are required to take at least three courses from the following six Bioengineering courses. Other courses may be substituted but must be approved by the bioengineering graduate advisor. Students from non-engineering backgrounds are also required to take BIEN 264 as one of their core course requirements.

### Bioengineering Core

1. BIEN 223 - Engineering Analysis of Physiological Systems
2. BIEN 224 - Cellular and Molecular Engineering
3. BIEN 245 - Optical Methods in Biology, Chemistry, and Engineering

4. BIEN 249 - Integration of Computational and Experimental Biology
5. BIEN 264 - Biotransport Phenomena
6. BIEN 270 - Transport with Reactions in Biological Systems

Other required courses:

1. One bioscience class chosen from: BCH 210, BCH 211, BCH 212, BIOL/CMDB 200, BIOL/CMDB 201, BIOL 203, BIOL 221/MCBL 221/PLPA 226, or, with consent of instructor, BMSC 229, BMSC 230, BMSC 231, BMSC 232, BMSC 234, and BMSC 235.
2. Other courses may be substituted but must be approved by the Bioengineering Graduate Advisor.
3. BIEN 286 - Colloquium in Bioengineering  
This course is required every quarter in which it is offered.

Additional courses may be required by the Advisory Committee depending on the student's background and fields of interest.

M.S. and Ph.D. students are expected to complete the course requirements for the programs within their first year of residence.

**Course Descriptions** All Bioengineering courses are listed and described under Bioengineering.

## Biological Sciences

**Subject abbreviation: BLSC**

**College of Natural and Agricultural Sciences**

Raphael Zidovetzki, Ph.D., Lead Advisor  
Program Office, 1223 Pierce Hall  
(951) 827-3579

**Faculty**, see listings for

Department of Biology  
Department of Botany and Plant Sciences  
Department of Cell Biology and Neuroscience  
Department of Entomology  
Department of Environmental Sciences  
Department of Nematology  
Department of Plant Pathology and Microbiology

The Biological Sciences interdepartmental major is not currently accepting new students. For more information, contact CNAS Undergraduate Academic Advising Center, 1223 Pierce Hall, (951) 827-7294.

### Major

Biological Sciences is an interdepartmental major that includes faculty (more than 150) from seven departments in the College of Natural and Agricultural Sciences. The major offers the B.S. degree and is unified by the Life Sciences core curriculum (see below, Major Requirements), which students complete during their initial years at UCR or at another

college or university (transfer students).

For advanced study in the junior and senior years, students select an area of specialization (track) from the nine that are now available: Bioinformatics and Genomics; Biology; Cell, Molecular and Developmental Biology; Conservation Biology; Evolution and Ecology; Environmental Toxicology; Medical Biology; Microbiology; and Plant Biology. Each track provides the opportunity to combine broad basic training in biological sciences with an emphasis in an area of particular interest to the student. Both the name of the major (Biological Sciences) and the track are included on the official transcript.

The organization of the major into tracks and the participation of a large number of faculty allows a diversity of student choices that could not be provided by a single department. The track structure allows flexibility to incorporate new faculty and research areas so students can prepare for graduate study and careers in emerging fields of biology. As their interests change and develop during the initial years at UCR, students can easily change their track selection for the junior and senior years.

As can be seen from the track descriptions and other items below, the Biological Sciences major provides preparation for a broad diversity of professional schools, graduate schools and careers. Students in this major and all others at UCR are eligible to complete admission requirements and apply to medical schools throughout the United States, including the 24 positions reserved for UCR students in the joint UCR/UCLA medical school (Thomas Haider Program in Biomedical Sciences). For additional information, see below, Admission Requirements for Medical and Health Professional Schools.

### University Requirements

See Undergraduate Studies section.

### College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

### Major Requirements

Some of the following requirements for the major may also fulfill the college's breadth requirements. Consult with a department advisor for program planning.

The major requirements for the B.S. in Biological Sciences are as follows:

1. Life Sciences core requirements (68-72 units)  
Students must complete all required courses with a grade of "C-" or better and with a cumulative GPA in the core courses of at least 2.0. Grades of "D" or "F" in two core courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.
  - a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - b) CHEM 001A, CHEM 001B, CHEM 001C,

CHEM 011A, CHEM 011B, CHEM 011C, CHEM 112A, CHEM 112B, CHEM 112C

- c) MATH 008B or MATH 009A, MATH 009B
- d) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC
- e) STAT 100A
- f) BCH 100 or BCH 110A

2. As specified in the individual tracks, at least 36 upper-division units for the major and 16 units of substantive course work related to the major. Courses in Statistics and Biochemistry taken as part of the core may be included.

A student is subject to discontinuation from the major whenever the GPA in upper-division course work is below 2.0. Students finding themselves in this circumstance must meet with an advisor.

### Bioinformatics and Genomics Track

Bioinformatics and Genomics are popular new fields whose emergence is catalyzed by the explosion of data made available through automated DNA sequencing. They meld in a seamless fashion genetics, molecular and cellular biology, statistics, and computer science. This curricular track has been carefully designed to be flexible so that avenues of study can be computational or experimental, or both, and therefore has wide appeal to students of varying interests. This track is unique in its ability to accommodate agricultural, microbial, and animal bioinformatics and genomics under a single programmatic umbrella and allow students to interface with instructors from a broad array of departments. The interdisciplinary nature of Bioinformatics and Genomics prepares students to be highly competitive for further graduate education or for immediate placement in biotechnology and allied industries.

1. Computer Science and Mathematics (16 units). These courses satisfy the related areas requirement.
  - a) CS 010, CS 012, CS 014
  - b) MATH 009C
2. Ethics and Science (4 units): At least one course from PHIL 117, PHIL 118, PHIL 161, RLST 170. This course may also satisfy a portion of the college's breadth requirements in Humanities.
3. Upper-division requirements (a minimum of 45 units)
  - a) BCH 110A (recommended) or BCH 100
  - b) BIOL 102, BIOL 105, BIOL 107A or BCH 110C, BIOL 119
  - c) STAT 100A, STAT 100B, STAT 160A, STAT 160B
  - d) Breadth electives (at least one course from each area)
    - (1) Bioinformatics and Computational Biology (CS 141 and MATH 112 recommended): CS 141, CS 166,

CS 170, CS 171, MATH 112,  
MATH 120, MATH 135A, STAT 160C,  
STAT 161, STAT 170A, STAT 170B

- (2) Genomics, Macromolecules, and Molecular Biology: BIOL 107B, BIOL 108, BIOL 109 or BCH 153/BIOL 153/BPSC 153 or BCH 162, BPSC 148/BIOL 148, CBNS 150/ENTX 150

**Note** Independent study or research in the field of bioinformatics or genomics is recommended.

### Biology Track

The Biology track provides up-to-date preparation for postgraduate study and careers in the fields of medicine, health science, teaching, and research. These options require understanding and integration of the different levels and processes of biological organization. The levels include cell and molecular, organismal, community and population; important life processes are reproduction, development, and evolution. An overview is presented in the introductory courses (BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C), and emphasis is placed on the unifying principles of the discipline.

The upper-division courses are more specialized and provide in-depth examination of specific subfields of biology. From a list of courses in each area, students select three upper-division courses in cell or molecular biology, two courses in the structure and function of organisms, and two courses in a subfield with the following integrated and overlapping topics: ecology, evolution, systematics, and behavior. Hands-on learning is encouraged so that students can participate rather than just observe science in this age of technology. Among the upper-division biology courses, there must be at least two courses that have a laboratory or field component.

Students in this track also select two courses from a number of options in computer science and statistics. Statistics is needed to plan and carry out experiments, read and understand scientific literature, and interpret data in medicine and other fields of science. Computers facilitate communication and data processing and storage, and computer technology is now an integral part of modern life.

1. Upper-division requirements [at least 36 units from the following, including two courses with laboratory or field component (indicated by \*)]

**Note** Courses listed in more than one category may be used to satisfy only one requirement.

- a) Cell/Molecular (minimum of one course from each category)
- (1) BCH 100 or both BCH 110A and BCH 110B
  - (2) BIOL 102 or BIOL 115
  - (3) BIOL 107A or BCH 110C, CBNS 101 or BIOL 113 or BIOL 114, BIOL 119, BIOL 128/CBNS 128,

BPSC 155/BIOL 155

- b) Functional Biology of Organisms (minimum of two courses with lecture component)

BIOL 100/ENTM 100\*,  
BIOL 104/BPSC 104\*,  
BIOL 121/MCBL 121,  
BIOL 121L/MCBL 121L\*, BIOL 124/  
MCBL 124, BIOL 132/BPSC 132\*,  
BIOL 134/PLPA 134,  
BIOL 134L/PLPA 134L\*,  
BIOL 138/BPSC 138\*,  
BIOL 143/BPSC 143\*, BIOL 151\*,  
BIOL 157\*, BIOL 159/NEM 159,  
BIOL 161A\*, BIOL 161B\*,  
BIOL 173/ENTM 173\*, BIOL 174,  
BIOL 175, BIOL 178, CBNS 106,  
CBNS 169

- c) Ecology/Evolution/Systematics/Behavior (minimum of two courses with lecture component)

BIOL 105, BIOL 108, BIOL 112/  
BPSC 112/ENTM 112, BIOL 116,  
BIOL 116L\*, BIOL 117 or BIOL 127/  
ENTM 127, BIOL 119, BIOL 152/  
GEO 152\*, BIOL 160, BIOL 160L\*,  
BIOL 162/ENTM 162, BIOL 163\*,  
BIOL 174

- d) Additional Elective Courses

BIOL 107B, BIOL 109\* or BCH 153/  
BIOL 153/BPSC 153\*, BIOL 110,  
BIOL 120/MCBL 120/  
PLPA 120, BIOL 120L/MCBL 120L/  
PLPA 120L\*, BIOL 122/MCBL 122,  
BIOL 123/MCBL 123/PLPA 123,  
BIOL 148/BPSC 148, BIOL 158, BIOL  
165/BPSC 165\*, BIOL 166\*, BIOL 168,  
BIOL 171, BIOL 171L\*, BIOL 185 (E-Z),  
BIOL 191, CBNS 150/ENTX 150

2. Statistics/Computer Science requirement (two courses)

CS 010, CS 011/MATH 011, CS 012,  
CS 014, CS 021, CS 061, CS 120A/  
EE 120A, CS 143/EE 143, STAT 100A,  
STAT 100B

3. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52. Eight of these units may be from a declared minor in one of the science colleges, or additional lower-division science requirements for the teaching credential (advisor's approval required).

### Cell, Molecular, and Developmental Biology Track

Cell, Molecular, and Developmental Biology are important subdisciplines in the Biological Sciences. Students take a series of gateway courses and at least one upper-division laboratory course which acquaints them with the basic techniques used in this field, introduces them to experimental design in the laboratory, and teaches them how to interpret laboratory data. Students build depth in Cell, Molecular,

and Developmental Biology by taking additional upper-division lecture courses from a diverse menu that may be tailored to suit each student's interests. Students add breadth to their science training by completing courses from the list of "additional courses." Students interested in the medical or health science field should choose appropriate medically related courses from this list.

Training in this field will prepare students for numerous educational opportunities upon graduation, including medical, dental, optometry, veterinary, and graduate school. In addition, numerous positions are available in teaching (for secondary level see Biology track), business, biotechnology, forensics, law, biomedical and basic research, agriculture, and government.

1. Upper-division requirements [must include at least one laboratory course (indicated by \*) from either category 1.b) or 2.]

- a) Required courses (20–24 units)

(1) BCH 110A and BCH 110B  
(recommended) or BCH 100

(2) BIOL 102, BIOL 107A, CBNS 101,  
CBNS 108

- b) Additional requirements (a minimum of 20 units from the following list)

**Note** Credit is awarded for only one of BIOL 109 or BCH 153/BIOL 153/ BPSC 153.

(1) Cell Biology: BIOL 109\*, BIOL 113,  
BIOL 114, BPSC 135, CBNS 116,  
CBNS 120/PSYC 120

(2) Molecular Biology:  
BCH 153/BIOL 153/BPSC 153\*,  
BIOL 107B, BIOL 115,  
BIOL 155/BPSC 155

(3) Developmental Biology: BIOL 168,  
CBNS 169

2. Additional courses from the following to bring total units to 52.

BCH 102\*, BCH 120, BCH 162\*,  
BIOL 104/BPSC 104\*, BIOL 110,  
BIOL 119, BIOL 121/MCBL 121,  
BIOL 121L/MCBL 121L\*,  
BIOL 123/MCBL 123/PLPA 123,  
BIOL 124/MCBL 124, BIOL 128/CBNS 128,  
BIOL 132/BPSC 132\*, BIOL 138/BPSC 138\*,  
BIOL 143/BPSC 143\*, BIOL 148/BPSC 148\*,  
BIOL 161A\*, BIOL 171, BIOL 171L\*, BIOL  
191, CBNS 106, CBNS 120L/PSYC 120L\*,  
CBNS 125/PSYC 125, CBNS 150/ENTX 150,  
ENTM 126L\*, ENTX 101

### Conservation Biology Track

Conservation biology seeks to understand the consequences of the rapid loss of Earth's diversity of life and to preserve biodiversity. Conservation Biology is a multidisciplinary science that applies principles of ecology, population genetics, evolutionary biology, and other sciences to solve problems related to the loss of biodiversity.

The emergence of conservation biology stems

from the recognition that Earth's ecological systems face critical problems from rapid growth of human populations and per capita resource consumption. A major focus of the discipline is the study of human impacts on biodiversity, with special emphasis on management processes that prevent species extinctions and ameliorate anthropogenic damage to ecosystems. People rely on a healthy biosphere for most of their basic requirements for food, medicines, chemicals, fibers, and building materials. Ecosystem processes are dependent on biodiversity and are critical for nutrient recycling, degradation of human wastes and pollutants, and maintenance of the chemical composition of the atmosphere. Biodiversity also provides important aesthetic benefits, as well as a vast genetic library that provides vital resources for the developing enterprise of biotechnology.

Students earning a bachelor's degree in Biological Sciences with the Conservation Biology track are trained to help society understand the extent and consequences of biodiversity loss, and to provide objective scientific data to resource managers and social planners. Students who are broadly trained in fields relevant to Conservation Biology, such as ecology, population genetics, evolutionary biology, and earth or environmental sciences, will be prepared for graduate study and a variety of careers in research, education or environmental consulting and management.

Suggested areas of specialization include ecology, evolution and systematics, and earth or environmental sciences. Because Conservation Biology is broadly interdisciplinary, students are advised to select lower-division courses in humanities and social sciences with an eye to the prerequisite structure of upper-division courses in Geology, Environmental Sciences, Anthropology, or Economics that might form their upper-division specialization.

1. Additional lower-division requirements
  - a) ECON 006/ENSC 006. This course also satisfies a portion of the breadth requirements in Social Sciences.
  - b) GEO 002
2. Upper-division requirements [at least 36 units from the following, including two courses with laboratory or field component (indicated by \*)]
  - a) BIOL 102
  - b) BCH 100 or BCH 110A
  - c) STAT 100A
  - d) Breadth Electives (a minimum of one course from each of the following areas)
    - (1) Evolution and Systematics: BIOL 105, BIOL 108, BIOL 112/BPSC 112/ENTM 112, GEO 151\*
    - (2) Ecology: BIOL 116, BIOL 116L\*, BIOL 117, BIOL 127/ENTM 127, BPSC 146\*
    - (3) Biological Diversity: BIOL 100/ENTM 100\*,

BIOL 104/BPSC 104\*, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L\*, BIOL 151\*, BIOL 161A\*, BIOL 163\*, ENTM 109\*, ENTM 114\* (may be applied either to Biological Diversity or to Applications)

(4) Biogeography and the Physical Environment: ENSC 100/SWSC 100\*, GEO 152\*, GEO 153, GEO 161\*, GEO 162\*, GEO 168\*, GEO 169\*

(5) Applications: ANTH 134, ANTH 170/BPSC 170, BIOL 165/BPSC 165\*, BIOL 166\*, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 143C/ENSC 143C, ENTM 114\* (may be applied either to Biological Diversity or to Applications), ENSC 172, ENSC 174, GEO 157\*, GEO 167\*

3. Specialization: 12 units of upper-division and/or substantive courses in an area of specialization chosen in consultation with a faculty advisor. A maximum of 4 units of 190-series independent study courses may be used to satisfy a portion of the specialization requirement.
4. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

### Environmental Toxicology Track

The effect of environmental pollutants on human health and other biological systems, and the impact of human activity on the environment is a growing source of public concern. Consequently, there is an increasing demand on government, industry and academia for scientists trained in a variety of environmental disciplines.

The Environmental Toxicology curriculum fills this need and provides students with a strong foundation in biology and biochemistry, as well as training in environmental toxicology. All Environmental Toxicology track students must complete a series of courses designed to provide a broad, fundamental understanding of environmental toxicology. Graduates will be positioned to pursue careers in environmental toxicology and other environmental life sciences and have the required background for entry into graduate, medical, dental, or veterinary programs.

1. Upper-division required courses (40–44 units)
  - a) BCH 100 or both BCH 110A and BCH 110B
  - b) BIOL 102, BIOL 107A or BCH 110C, CBNS 101 or BIOL 113 or BIOL 114, BIOL 116
  - c) CHEM 136/ENSC 136/ENTX 136 or ENSC 101, ENSC 102
  - d) CBNS 150/ENTX 150, ENTX 101, ENTX 154
2. Additional upper-division requirements (four courses from the following, with at

least one from Chemical Fate and one from Health/Ecology)

a) Chemical Fate: CHEM 005, CHEM 109, CHEM 125, CHEM 135/ENSC 135/ENTX 135, CHEM 150A, CHEM 150B, ENVE 144/ENSC 144, ENSC 100/SWSC 100, ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 127/SWSC 127, ENSC 140/SWSC 140, ENSC 141/MCBL 141/SWSC 141, ENSC 142, ENSC 155, ENSC 163, ENSC 172, ENSC 174, ENSC 176/SWSC 176

b) Health/Ecology: BCH 102, BCH 153/BIOL 153/BPSC 153, BCH 184, BIOL 108, BIOL 109, BIOL 115, BIOL 117, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 124/MCBL 124, BIOL 128/CBNS 128, BIOL 161A, BIOL 161B, BIOL 168, BIOL 171, BIOL 171L, CBNS 106, CBNS 169, ENTM 126, ENTM 128

3. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

### Evolution and Ecology Track

Evolution is the central unifying concept linking all areas of the Biological Sciences. Ecology is the study of the interrelationships and interactions between organisms and their environment that drive adaptation and dictate the distribution and abundance of organisms.

An area of specialization in Evolution and Ecology primarily serves students who are interested in entering graduate school in one of these fields or in directly entering a career in a related area, such as in an environmental consulting firm or local, state, or federal agency that deals with ecological issues.

Students can focus their training to prepare themselves for further graduate study in numerous areas of the Biological Sciences, further study in a number of health related professions (medicine, dentistry, veterinary medicine, optometry), and a biological sciences career within private industry, local, state, or federal government.

1. Upper-division requirements [at least 36 units from the following, including one course with laboratory or field component (indicated by \*)]
  - a) Required courses
    - (1) BCH 100
    - (2) BIOL 102
    - (3) At least three courses from BIOL 105, BIOL 108, BIOL 112/BPSC 112/ENTM 112, BIOL 116, BIOL 160. Courses not used to meet this requirement can be applied to additional requirements.
  - b) Additional requirements (at least one course from each of the following areas)

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- (1) Biological Diversity: BIOL 100/ENTM 100\*, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L\*, BIOL 151\*, BIOL 157\*, ENTM 114\*
  - (2) Functional Biology and Behavior: BIOL 138/BPSC 138\*, BIOL 160, BIOL 160L\*, BIOL 161A\*, BIOL 161B\*, BIOL 162/ENTM 162, BIOL 174, BIOL 175, BIOL 178
  - (3) Ecology and Evolution: BIOL 105, BIOL 108, BIOL 112/BPSC 112/ENTM 112, BIOL 116, BIOL 116L\*, BIOL 117, BIOL 119, BIOL 127/ENTM 127, BIOL 148/BPSC 148, BIOL 165/BPSC 165\*, BIOL 163\*, BIOL 166\*, BPSC 146\*
2. Statistics requirement (minimum of one course) STAT 100A, STAT 100B
  3. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

### Medical Biology Track

The Medical Biology track provides a solid foundation in science and mathematics for students who plan a career in medicine, health sciences or veterinary medicine. The track is also excellent preparation for graduate research in modern cell and molecular biology and physiology.

Although clinical courses are not part of the curriculum, the track prepares students for specific training for clinical applications in the health sciences, including medicine, veterinary medicine, osteopathic medicine, chiropractic medicine, dentistry, podiatry, optometry, pharmacy, laboratory technology, public health, nursing, physical therapy, nutrition, epidemiology, forensics, hospital administration, and physician's assistant. Additional information and Web sites are provided below (see Suggestions for Elective Units for Medical/Health Professions, Admission Requirements for Medical and Health Professional Schools).

As can be seen from the breadth of courses included in the curriculum of the track, health sciences is a complex and diverse field with much research, new technology and opportunity. It is a major part of the economy of this country, and there is a continuing need for motivated and well-trained workers, teachers, practitioners and researchers in all aspects of the field.

1. Upper-division requirements [at least 52 units from the following, including two courses with laboratory or field component (indicated by \*)]
  - a) Cell/Molecular
    - (1) Required courses (15–20 units)
      - BCH 100 or both BCH 110A and BCH 110B
      - BIOL 102 or BIOL 115
      - CBNS 101 or BIOL 113 or BIOL 114
      - BIOL 107A or BCH 110C
    - (2) Elective options: BCH 102\*,

BCH 110B, BCH 110C, BIOL 107B, BIOL 109\*, BIOL 155/BPSC 155

- b) Physiology/Anatomy (minimum of two courses with lecture component): BCH 120, BIOL 161A\*, BIOL 161B\*, BIOL 171, BIOL 171L\*, BIOL 174, BIOL 175, BIOL 178
- c) Neuroscience/Pharmacology (minimum of one course with lecture component): CBNS 106, CBNS 116, CBNS 120/PSYC 120, CBNS 120L/PSYC 120L\*, CBNS 124/PSYC 124, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127, ENTX 101
- d) Pathogenesis (minimum of two courses with lecture component)
  - (1) Required course: BIOL 121/MCBL 121
  - (2) Elective options:
    - BIOL 121L/MCBL 121L\*, BIOL 122/MCBL 122, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L\*, BIOL 159/NEM 159, BIOL 157\*, CBNS 150/ENTX 150, ENTM 126, ENTM 126L\*
- e) Genomics/Bioinformatics (minimum of one course): BIOL 107B, BIOL 109\* or BCH 153/BIOL 153/BPSC 153\* or BCH 162\*, BIOL 119, BPSC 148
- f) Immunology (elective option): BIOL 128/CBNS 128
- g) Development/Embryology (elective options): BIOL 168, CBNS 169
- h) Additional elective courses to bring total units to 52: ANTH 170/BPSC 170, BIOL 100/ENTM 100\*, BIOL 104/BPSC 104\*, BIOL 105, BIOL 108, BIOL 110, BIOL 116, BIOL 116L\*, BIOL 151\*, BIOL 160, BIOL 160L\*, CHEM 109, CS 010, STAT 100B

### Microbiology Track

Microorganisms are ubiquitous from the stratosphere to the depths of the ocean. They encompass the greatest metabolic diversity of all life forms. Many are important in conversion of food products, and more yet, in their spoilage. Some produce important medicinal products, while others, the most potent toxins known. Many are beneficial as symbionts to animals and plants, yet others effect their demise. Students earning a B.S. degree in Biological Sciences with the Microbiology track will be trained for technical careers in a broad spectrum of the medicinal, agricultural, biotechnology, and environmental fields as consultants and technicians. Students specializing in the Microbiology track will also be prepared to continue studies at the graduate level, earn teaching credentials, or enter professional

schools in medicine, dentistry, or veterinary medicine.

1. Upper-division core requirements (31–32 units)
  - a) BCH 110A, BCH 110B; BCH 110C or BIOL 107A
  - b) BIOL 102 or BIOL 115, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 157
  - c) BIOL 123/MCBL 123/PLPA 123
2. Additional upper-division requirements (at least three courses from the following) BIOL 107B, BIOL 109, BIOL 113, BIOL 114, BIOL 120/MCBL 120/PLPA 120, BIOL 122/MCBL 122, BIOL 124/MCBL 124, BIOL 128/CBNS 128, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L, BIOL 159/NEM 159, CBNS 101, ENSC 141/MCBL 141/SWSC 141, ENSC 155
3. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

### Plant Biology Track

The track in Plant Biology is built on the premise that students with training in plant biology fill unique and diverse niches in academia, industry, medicine, business, law, biotechnology, government and agriculture. The track is a flexible one that can be tailored to an individual's interests and career goals. Students should consult with a faculty advisor to clarify educational goals and to plan an appropriate program of study.

The Plant Biology track can prepare students for a wide array of graduate or professional training programs or employment positions in the fields of agronomy, biochemistry, biotechnology, botany, cell biology, conservation biology, developmental biology, ecology, ethnobotany, evolution, dentistry, genetics, horticulture, medicine, molecular biology, plant breeding, plant pathology, plant physiology, systematics, and veterinary medicine. While Plant Biology is not considered a traditional track for students who plan careers in medicine, veterinary medicine, or dentistry, professional schools may view the individuality of training in plant biology as an asset.

**Notes** BCH 110A is strongly recommended.

1. Upper-division core requirements (28–32 units)
  - a) BIOL 102
  - b) BPSC 104/BIOL 104 (may be waived with consent of the faculty advisor)
  - c) BIOL 132/BPSC 132, BIOL 143/BPSC 143, BPSC 133
  - d) At least 8 units from the following:
    - BIOL 100/ENTM 100, BIOL 120/MCBL 120/PLPA 120, BIOL 120L/MCBL 120L/PLPA 120L, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L,

BIOL 123/MCBL 123/PLPA 123,  
BIOL 124/MCBL 124, BIOL 134/  
PLPA 134, BIOL 134L/PLPA 134L,  
BIOL 159/NEM 159, BPSC 134/  
ENSC 134/SWSC 134, ENSC 120/  
NEM 120/SWSC 120, ENTM 124

e) Two (2) units of BPSC 195H, BPSC 197,  
BPSC 198-I, or BPSC 199

2. Additional upper-division requirements (20  
units must come from one of the following  
four areas of specialization)

a) Plant Cellular, Molecular, and Develop-  
mental Biology

(1) BPSC 135

(2) Additional units from the following to  
meet the B.S. requirement:

BCH 102, BCH 110B, BCH 110C or  
BIOL 107A, BCH 153/BIOL 153/  
BPSC 153, BCH 162, BCH 183,  
BIOL 107B, BIOL 113, BIOL 114,  
BIOL 121/MCBL 121, BIOL 121L/  
MCBL 121L, BIOL 123/MCBL  
123/PLPA 123, BIOL 155/BPSC 155,  
BIOL 168, CBNS 101, CBNS 108

b) Plant Genetics, Breeding, and  
Biotechnology

(1) BPSC 150

(2) Additional units from the following to  
meet the B.S. requirement:

BCH 153/BIOL 153/BPSC 153,  
BIOL 105, BIOL 107A, BIOL 107B,  
BIOL 108, BIOL 109, BIOL 119,  
BIOL 148/BPSC 148, BIOL 155/  
BPSC 155, BPSC 135, BPSC 158,  
CBNS 108

c) Ecology, Evolution, and Systematics

(1) BPSC 146

(2) Additional units from the following to  
meet the B.S. requirement:

ANTH 170/BPSC 170, BIOL 105,  
BIOL108, BIOL 112/BPSC 112/  
ENTM 112, BIOL 116, BIOL 116L,  
BIOL 117, BIOL 138/BPSC 138,  
BIOL 165/BPSC 165, BPSC 134/  
ENSC 134/SWSC 134, BPSC 158,  
BPSC 166, ENSC 100/SWSC 100,  
GEO 151

d) Plant Pathology, Nematology, and Pest  
Management

(1) BIOL 120/MCBL 120/PLPA 120

(2) Additional units from the following to  
meet the B.S. requirement:

BCH 183, BIOL 100/ENTM 100,  
BIOL 120/MCBL 120/PLPA 120,  
BIOL 120L/MCBL 120L/PLPA 120L,  
BIOL 121/MCBL 121, BIOL 121L/  
MCBL 121L, BIOL 123/MCBL 123/  
PLPA 123, BIOL 124/MCBL 124,  
BIOL 127/ENTM 127, BIOL 134/  
PLPA 134, BIOL 134L/PLPA 134L,  
BIOL 159/NEM 159, BPSC 133,

BPSC 146, BPSC 150, BPSC 158,  
BPSC 166, ENSC 104/SWSC 104,  
ENTM 109, ENTM 124, ENTM 129,  
ENTM 129L, ENSC 100/SWSC 100,  
ENSC 120/NEM 120/SWSC 120

3. Additional upper-division courses in biological  
sciences and related areas from any of the  
above lists, and students may apply a max-  
imum of six units of BPSC 190 and/or  
BPSC 197 and/or BPSC 198-I and/or  
BPSC 199 to bring total units to 52.

## Honors Program

The Honors Program in the Biological Sciences  
interdepartmental major is designed to provide  
qualified upper-division students with opportu-  
nities to engage in the theory and practice of  
original research, and to learn the art of written  
and oral scientific communication.

Prerequisites for the Honors Program

1. Submission of an application to the  
University Honors Program during the spring  
quarter of the sophomore year or during fall  
quarter of the junior year

2. Junior standing (completion of a minimum  
of 90 units)

3. Minimum GPA requirements or consent of  
director

a) Cumulative GPA of 3.50

b) A GPA of 3.50 in upper-division major  
courses

Students who meet the requirements of the  
University Honors Program for academic excel-  
lence are invited at the end of their sophomore  
year to participate in the Biological Sciences  
Undergraduate Honors Program during their  
junior and/or senior years. Students in the pro-  
gram are required to complete BLSC 192H and  
BLSC 193H, seminar/thesis courses for a total  
of 4 units. The students are also required to  
enroll in BLSC 198H and BLSC 195H to work  
on and complete an honors thesis under the  
supervision of a faculty member, for a total of  
12 units distributed over three to six quarters  
in their junior and senior years.

## Selecting a Track

The requirements of the Life Sciences core  
curriculum occupy most of the first two years of  
study; therefore, Biological Sciences majors  
need not select their area of specialization  
(track) until the beginning of the junior year.  
However, if a student desires, a track can be  
selected earlier. For assistance in selecting a  
track, a student should consult with a faculty  
advisor in the area of interest. Consultations of  
this kind are conducted in the CNAS Academic  
Advising Center (1223 Pierce Hall). To declare  
a track or transfer from one track to another,  
students inform the Advising Center staff.

## Comparison of Tracks in Biological Sciences Major with Departmental Majors

Also available at UCR are some departmental  
majors similar to certain tracks within the  
Biological Sciences major. The upper-division  
requirements for the departmental majors in  
Biology and Plant Biology (see those sections  
in this catalog) are similar to the requirements  
in the Biology and Plant Biology tracks, respec-  
tively. The Life Sciences core curriculum is  
required for these departmental majors as with  
all the tracks in the Biological Sciences major,  
so students in good standing can easily transfer  
from one major to another simply by filing the  
Change of Major form.

A choice of a B.A. or B.S. degree is available for  
the departmental Biology major, whereas only  
the B.S. degree is offered for the Biology track  
and all other tracks in the Biological Sciences  
major. In comparison with the departmental  
Biology major, the Biology track has a more  
prescribed selection for the upper-division  
courses. The Biology major requires genetics  
(BIOL 102) and an additional 32 upper-division  
units to be selected from courses on the  
approved list. The Biology track is intended to  
ensure a breadth of course work in life sci-  
ences in contrast to the other more specialized  
tracks in the Biological Sciences major. As  
described below, the 36 units of upper-division  
courses for the Biology track must include at  
least two laboratory or field courses, three  
courses in the cell/molecular area (including  
genetics), two courses in the functional biology  
of organisms, and two courses in the integrated  
fields of ecology/evolution/systematics/behavior.

The departmental Plant Biology major differs  
from the Plant Biology track primarily in offer-  
ing a B.A. option in addition to the B.S. option.  
The upper-division course requirements are  
identical for the departmental major and the  
Plant Biology track.

## Enrollment Options and Advising

The CNAS Academic Advising Center (1223  
Pierce Hall, [951] 827-3579) is the advising  
office for all students majoring in Biology,  
Biological Sciences, Plant Biology, and  
Neuroscience. The CNAS Academic Advising  
Center is open Monday through Friday, 9 a.m.  
to noon and 1 to 4 p.m. Faculty advisors are  
usually available for advising Tuesday through  
Friday, 10 a.m. to noon and 1 to 3 p.m.

Advising is on a walk-in basis. Students sign in  
at the counter indicating what is needed. A  
quarterly schedule, available at the counter,  
lists faculty advisors, their advising hours, and  
areas of specialization.

Prospective, new, and continuing students  
considering enrollment in the above majors are  
welcome to visit or phone the CNAS Academic  
Advising Center. Information is provided about  
the majors, policies and procedures, and course  
enrollment. Petitions and other related business  
requiring a signature or approval are routed

through the CNAS Academic Advising Center. Students visit the CNAS Academic Advising Center as needed, but those in academic difficulty are especially urged to meet with a faculty advisor to review study procedures and plan a program of study to correct deficiencies and achieve academic success. With informational handouts and advising, all students are urged to create a long-range academic plan so that course prerequisites are met and courses are taken in the best possible sequence for the individual's interests, aptitude, and career goals. Note that a course load of approximately 16 units per quarter is required for normative progress toward the degree.

### Grading Basis: Letter Grade or Satisfactory (S)/No Credit (NC)

Students must enroll for letter grade credit in science and mathematics courses used to satisfy major requirements. This includes all courses in the Life Sciences core curriculum, the 36 upper-division units for the major, and the 16 units of substantive course work related to the field of the major. After completion of the core requirements and upper-division requirements for the major, science and mathematics courses counted as electives may be taken on a Satisfactory (S)/No Credit (NC) basis.

Basic Writing and English Composition (ENGL 001A, ENGL 001B, ENGL 001C) may be taken on an S/NC basis, but this is strongly not recommended. English composition is essential and so important that students should aim for excellence rather than a satisfactory level of achievement. Foreign language courses may be completed on an S/NC basis, but this is also not recommended. Since language courses are often taken in series, progress is cumulative, and students may fall behind if only a satisfactory level is attempted in early courses in the sequence.

For policies on S/NC grading, see the Academic Regulations section of this catalog.

### Full- or Part-time Study

Students ordinarily enroll full-time in 12 to 18 units of course work each quarter. Advisor approval is required for exceptions. The dean's approval is required for any change in the academic program that reduces enrollment below 12 units for the quarter. Students who are unable to enroll full-time because of health, family responsibilities, or outside employment may apply to the CNAS Academic Advising Center (1223 Pierce Hall) for permission to enroll part-time. Documentation of hours of employment is required. Part-time students may take no more than 10 units in one quarter, and they receive a 50 percent reduction in the Educational Fee for that quarter.

### Minor

The Biological Sciences major does not offer a minor in Biological Sciences, but seven disciplinary minors (Applied Statistics, Botany and

Plant Sciences, Chemistry, Entomology, Environmental Sciences, Mathematics, Neuroscience, Physics) are offered by departments within the College of Natural and Agricultural Sciences. Interested students are referred to those sections of this catalog. Other available minors include Computer Science in the College of Engineering, and more than 40 minors in the College of Humanities, Arts and Social Sciences.

For students enrolled as a Biological Sciences major, a minor added to the program must be in an area that is distinctive and different from the chosen track (e.g., a minor in Botany and Plant Sciences is not permitted with the track in the same field).

### Double Major

A double major can be completed with a track in Biological Sciences and another major, as long as the chosen majors are in distinct and different fields. Biological Sciences can be either the first (primary) or second major, depending on which one is chosen for matriculation and emphasis. The Life Sciences core curriculum and requirements for one of the tracks in Biological Sciences must be completed. Completion of two tracks within Biological Sciences does not count as a double major since both tracks are within the same major.

Double majors are not allowed between certain tracks in Biological Sciences (Biology, Plant Biology) and the similar departmental major in the same field (Biology and Plant Biology). Some or all of the requirements may be completed for more than one track, but only one track will be approved for inclusion on the transcript.

### Transfer Students

Students planning to transfer to UCR with a major in Biological Sciences, Biology, or Plant Biology must have "C" or higher grades in general chemistry (item 1, below) and at least two of the remaining sequences in the recommended priority 2, 3, 4, 5. This is a minimal course requirement for transfer to the above majors from community colleges and four-year colleges and universities, but all five sequences are necessary for graduation in these majors at UCR. Transfer students will usually find it advantageous to complete most or all sequences before starting at UCR. All prospective transfers should try to complete the sequences they begin rather than divide a sequence between two campuses.

1. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C
2. First-year calculus, equivalent to MATH 009A, MATH 009B
3. Introductory biology (for science majors), equivalent to BIOL 005A, BIOL 051A, and BIOL 005B (and BIOL 005C, if available)
4. Organic chemistry, equivalent to CHEM 112A, CHEM 112B, CHEM 112C
5. General physics with laboratory equivalent to

PHYS 002A, PHYS 002B, PHYS 002C (and PHYS 021A, PHYS 021B, PHYS 021C) or PHYS 040A, PHYS 040B, PHYS 040C. Calculus is a prerequisite for both the PHYS 002 and PHYS 040 sequences.

To be eligible to transfer into one of the above majors, students must also have a minimum GPA of 2.70 in transferable college courses.

If the equivalents of BIOL 005A, BIOL 051A, and BIOL 005B are not accessible prior to transfer, students are strongly recommended to complete organic chemistry and take the BIOL 005 sequence at UCR rather than the equivalent of BIOL 002 and BIOL 003 (introductory biology for nonscience majors) before transfer.

Completion of calculus is strongly recommended before transfer. If sequences 1-3 are completed, students are also encouraged to complete one year of organic chemistry with laboratory (for which a one-year general chemistry series is a prerequisite). Partial satisfaction of the breadth requirements (e.g., English, humanities, arts, social sciences, and ethnic studies) also accelerates the student's progress, but priority should be given to the above mathematics and science sequences.

UCR has articulation agreements with most of the California community colleges. These agreements list specific community college courses that have been designated as comparable to UCR courses (see the statewide articulation Web site at [www.assist.org](http://www.assist.org)).

To integrate transfer credits with a program of study at UCR, it is important that all new transfer students consult with an advisor before or early in their first quarter on campus. Prospective UCR students are welcome to discuss their past and future academic program with an advisor. Phone the CNAS Academic Advising Center, (951) 827-3579, to arrange an appointment.

### Independent Study and Research

The various departments and programs in the College of Natural and Agricultural Sciences offer courses in which students can enroll to do independent laboratory or field research or an in-depth library study of a topic of special interest. These courses are numbered 194-199 and usually have variable unit credit allowing for differences in emphasis and time available for research in the student's academic program.

The departments have different names and policies for the 190-series courses: Independent Reading, Introduction to Research, Research for Undergraduates, Junior/Senior Research, Senior Research, Senior Honors Research. Interested students should consult with a professor who is willing to supervise the project. The student may suggest a specific question or formulate a project after consultation with the instructor. Information about the research fields of the professors is available from the CNAS Academic Advising Center (1223 Pierce Hall).

The procedure for enrolling in these courses depends on the policies of the department or academic unit sponsoring the research. For BIOL 194, BIOL 197 and BIOL 199, the student must obtain an application form from the CNAS Academic Advising Center. Instructions for writing a brief description of the proposed project are provided with the form. The completed application, signed by the professor in charge of the project, is submitted to the CNAS Academic Advising Center preferably before the first day of the quarter but no later than the end of the second week of the quarter.

Applicants for independent research should ordinarily be sophomores, juniors or seniors in good standing and achieving well in their academic program.

Courses numbered 194, 197, 199 and 199H may be taken for a letter grade or "S/NC" depending on the department or program offering the course. Up to 9 units of credit in the 190 series may be counted as part of the 16 substantive units related to the major for the B.S. degree.

## Internships

Internships provide students with practical, part-time work experiences in conjunction with their academic studies. The internships are designed to relate a student's academic preparation in the major with professional work at the entry level in community businesses and organizations. They can be one or more quarters in duration. For more information or to arrange an internship, see the Internship Coordinator in Career Services (Veitch Student Center).

As much as possible, the internships are arranged to accommodate the student's specific interests. Students majoring in Biological Sciences (or Biology, Plant Biology, Neuroscience) commonly work in local hospitals, clinics, museums and medical research laboratories. Some students do internships in health administration, environmental planning and natural resource management. Those considering high school teaching as a possible career can work as tutors or teacher's aides in local high schools (e.g., EDUC 100).

Students majoring in Biological Sciences are welcome to participate in the internship program, but they are not paid for this work. Academic credit is not awarded unless a faculty advisor approves, and the student is enrolled in a 198 course in the College of Natural and Agricultural Sciences. Students frequently find internships helpful in investigating a possible career, and some experience in the work environment is helpful or required for admission to professional and technical training schools.

## Teaching Credential

Teachers in the public schools of California must be certified by the California Commission on Teacher Credentialing (CCTC). The credential requires an undergraduate major, baccalaureate degree, and completion of a graduate credential program such as that offered by the Graduate School of Education at UCR (see Education section, Credential Programs, in this catalog). The latter usually requires three quarters and includes education courses and supervised teaching.

Before admission and student teaching in a graduate credential program, candidates must pass the California Basic Education Skills Test (CBEST) and demonstrate subject-matter proficiency in the fields in which they will teach. Candidates can demonstrate proficiency either by passing the commission's subject-matter assessment examination (CSET), or by completing an undergraduate program that is CCTC approved for teacher preparation.

For students in Biological Sciences and all other majors at UCR, this campus has a CCTC-approved undergraduate program leading to a Multiple Subjects Credential and teaching in the elementary (K-6) grades. A breadth of course work is necessary in addition to the specified requirements for the major. Students are urged to start early, preferably as freshmen, selecting courses most helpful for this career. Students who want a Multiple Subjects Credential must pass the subject-matter proficiency examination (CSET, Multiple Subjects).

UCR does not have a CCTC-approved undergraduate program for Biological Sciences or other science majors who wish to teach at the secondary level. The single-subject, Teaching Credential in Science, biology emphasis, is required for biology teachers, grades 7-12, and adults. Students who plan to get this credential must take the CSET and should make certain that their academic program includes preparatory course work. This is most easily achieved with the breadth of courses required in the Biology track of the Biological Sciences major, but other tracks or majors may be used, provided there is sufficient breadth to pass the CSET exam.

For the Teaching Credential in Science with emphasis in biology, the subject-matter examination (CSET) includes 1) biology/life science in depth and 2) general science with introductory, college-level biology, chemistry, physics, and geoscience (geology, meteorology, oceanography, astronomy). Introductory biology, chemistry, and physics are included in the Life Sciences core curriculum, but some additional course work in geoscience should be taken to strengthen preparation in this area. The intent is that candidates for the Teaching Credential in Science are prepared to teach unifying themes and principles in general and specialized science courses.

There are other credential options (e.g., BCLAD) and requirements that may be completed during

the undergraduate years. Requirements include knowledge of the U.S. Constitution and courses in health (EDUC 044), cardiopulmonary resuscitation, and mainstreaming (EDUC 116). Additional information is provided in orientation meetings and the Graduate School of Education (1124 Sproul Hall; [www.education.ucr.edu/teach](http://www.education.ucr.edu/teach)).

### California Teach-Science/Mathematics Initiative

**(CaTEACH-SMI)** California Teach-Science Mathematics Initiative (CaTEACH-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CaTEACH-SMI at UCR offers undergraduate students paid/unpaid opportunities to explore STEM teaching as a career option. Through CaTEACH-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CaTEACH-SMI Resource Center provides future STEM teachers with material and financial resources to promote planning and professional development towards a science/mathematics education career.

For more information about the CaTEACH-SMI program, please visit <http://smi.ucr.edu> or at the Resource Center at 1315 Pierce Hall.

## Preparation for Graduate School

All the tracks in the Biological Sciences major and the departmental majors in life science (Biology, Plant Biology, Entomology, Neuroscience) are appropriate as preparation for those planning to attend graduate school for advanced degrees (Master's, Ph.D.). The faculty advisor assists in selecting combinations of courses appropriate for advanced study in the various fields of biology. Students considering graduate study are encouraged to do undergraduate research and include courses in computer science and statistics in their program.

The campuses and departments of the UC set their own requirements for admission to graduate school, but students should expect that at least a "B" average is required to be eligible for consideration. Higher levels are usually necessary for applicants to be competitive for admission as well as financial assistance (e.g., graduate fellowship, teaching assistantship). Letters of recommendation, undergraduate research, and results on the nationwide Graduate Record Examination are also considered. A minimum GPA of 2.50 in the last 60 units of undergraduate course work is necessary to be eligible for admission to master's degree programs in the California State University system, but campuses and departments usually have additional or higher requirements.

## Preparation for Medical/Health Professions or Veterinary Medicine

**Suggestions for Elective Units** Students must complete a minimum of 180 units for a bachelor's degree at UCR, and each of the nine tracks in the Biological Sciences major and the departmental majors in life science have some unit space for elective courses. Depending on the courses chosen to meet other requirements, about 30 elective units remain among the 180 units required for graduation, after completion of English composition, humanities and social sciences breadth courses, the Life Sciences core curriculum, and the 52 upper-division and substantive units in the field of the major. Students planning a career in medicine or health science or other areas should give careful consideration to the use of their elective units to add breadth, perspective, and practical experience as part of the preparation for the professional schools and careers they have chosen. The following suggested activities were prepared after consultation with some medical school representatives.

### Communication Skills, Internships, Volunteer Work

Interaction with co-workers and patients is an integral part of health care professions. Students planning a career in this area need excellent social and communication skills and leadership experience. Patients must have confidence in the competence and judgment of medical professionals and know that recommendations and decisions are being made for the patient's benefit. Experiences that broaden understanding of the human condition and/or increase sensitivity towards the medically underserved will increase an applicant's chances for admission to medical school or other health professional programs.

As interest, time, and units permit, students should take more than the minimum required courses in English, humanities, arts, and social sciences. Volunteer work in health care facilities and community service agencies provides valuable experience and helps students clarify career interests and goals. EDUC 100 (2 units) can be taken for tutoring in the public schools, and coordinators in Career Services (Veitch Student Center) arrange for internships in local clinics, hospitals, laboratories, and community centers.

**Foreign Language, Study Abroad** There is much ethnic diversity in California and the United States, so proficiency in a foreign language (e.g., Spanish) is highly desirable for health care workers. Participation in the Education Abroad Program (EAP) is encouraged (see the EAP section of this catalog). Students interested in the language, literature, science, art, culture, history, government, or social institutions of the EAP countries have the opportunity to learn from first-hand experiences. Opportunities are available at each level, but the traditional year abroad is generally taken in the junior year. Short-term (one quarter or less) options are

available in selected countries in numerous academic fields. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

**Minor, Second Major** Students succeeding in their primary major may wish to add a minor or second major to the academic program. More than 40 minors are offered in the College of Humanities, Arts and Social Sciences, seven in the College of Natural and Agricultural Sciences, and one (Computer Science) in the College of Engineering. Additional lower- or upper-division course work, a minor or second major in a field distinct from the primary major adds breadth and individuality to the academic program and shows that the student has interest and proficiency beyond the field of the major. Information about minors and second majors is provided in other sections of this catalog.

**Expected Level of Computer Proficiency** Rapid changes and improvements in the health science field are occurring as a result of new technology and discoveries. Computers and complex instrumentation are routinely used in clinics and laboratories, so it is necessary to have computer skills and experience with lab equipment as provided in laboratory or field science courses. Undergraduates planning a career in medicine or other areas of science must have a knowledge of computer operating systems, word processing, spreadsheets, databases, E-mail, and the Internet. For those who have not reached this level of proficiency, CS 008 (Introduction to Computing, 4 units) is available as an elective.

**Genomics and Bioinformatics** These new research fields, along with clinical applications of proteomics, are having an increasing impact on all aspects of medical practice, including diagnosis, treatment and delivery of services. Information derived from these fields is included in the Life Sciences core and upper-division science courses, and students may wish to include more than the minimum requirement as part of their undergraduate and postgraduate studies.

**Independent Study and Research** Independent study is encouraged for future workers in medicine and other science research areas, and the various departments and programs on campus offer courses (numbered 194, 197, 199, 199H) in which students can enroll to do independent laboratory and/or field research or an in-depth library study of a topic of special interest. Students desiring to do such independent work should consult with a professor who is willing to supervise the project.

**Admission Requirements for Medical and Health Professional Schools** Most of the course work required for admission to professional schools is met by 1) the UCR requirements in English composition, humanities, arts, and social science and 2) the core curriculum for the various life science majors and tracks. Professional schools commonly require biochemistry, differential and integral calculus (MATH 008B or MATH 009A, MATH 009B), statistics (e.g.,

STAT 100A), some computer proficiency (e.g., CS 008), and one year of each of the following (with lab): introductory biology, inorganic chemistry, organic chemistry and physics.

Most schools require one or two years of college-level biology or zoology classes without specifying certain courses. Some schools, however, do require or highly recommend specific courses. Because of the amount and complexity of information in medical science, undergraduate students are urged to acquire strong preparation in major areas (e.g., biochemistry, genetics, microbiology, vertebrate anatomy and physiology, cell and molecular biology) so that they will not be overwhelmed with new information in professional school.

Information about required course work and admission tests (DAT, MCAT, VCAT, PCAT, GRE), can be obtained from Career Services (Veitch Student Center) and the Medical and Health Careers Program (visit 1114 Pierce Hall or [mhcp.ucr.edu](http://mhcp.ucr.edu)). Students must attend one orientation meeting prior to making an individual appointment at the Medical and Health Careers Program office. Several meetings are available each quarter (the schedule is available on the Web site or from 1114 Pierce Hall or 1223 Pierce Hall).

**Joint UCR/UCLA Medical School** Each year, 24 students at UCR are selected for admission to the UCR/UCLA medical school (Thomas Haider Program in Biomedical Sciences). For the classes starting medical school Fall 2006 and later, eligible students in Medical Biology and other tracks and majors at UCR can complete the admission requirements and apply for the 24 positions reserved for UCR students. The first two years of medical school are taken at UCR, while the next two (clinical) years are completed at medical facilities at or associated with UCLA (Geffen School of Medicine). Information about course work and other admission requirements for the UCR/UCLA medical program are provided at [www.biomed.ucr.edu](http://www.biomed.ucr.edu), under Biomedical Sciences in this catalog, at the Student Affairs Office for the program (B600 Statistics-Computer) and in orientation meetings held at UCR.

### Other Medical Schools, Osteopathic Medicine, Pharmacy, Dentistry, Optometry, Podiatry

A national organization for each medical profession publishes admission requirements, enrollment data and the curriculum for each school in that profession. The *Medical School Admission Requirements* book is usually available in the UCR Bookstore. Publications that outline requirements for other professional schools may be ordered from the bookstore, and they are available in Career Services (Veitch Student Center).

The most commonly required or recommended courses for professional schools in the above areas are biochemistry, genetics, cell and molecular biology, embryology or development, and (for pharmacy, optometry) human anatomy and physiology. Most professional schools

require that physics, chemistry and other science courses be taken with laboratory if possible. Some dental and optometry schools require one or two courses in psychology (e.g., PSYC 001, PSYC 002). Some dental schools require principles of management (e.g., BUS 010). Helpful electives for dental school include economics, social science, nutrition, and basic accounting.

Some medical schools recommend physical chemistry (e.g., CHEM 109) and one year of college-level mathematics (e.g., MATH 005, MATH 008B or MATH 009A, and MATH 009B or the MATH 009A, MATH 009B, MATH 009C sequence). Medical schools usually do not offer substantive instruction in parasitology, so students can gain lecture and laboratory strength in this area by including BIOL 157 in the undergraduate program.

The Medical College Admission Test (MCAT), Dental Admissions Test (DAT), and tests for other health professions are commonly taken in the spring or summer of the junior year, so chemistry, physics, mathematics and some upper-division courses (e.g., biochemistry, genetics, cell and molecular biology, vertebrate anatomy and physiology) should be completed as much as possible before the exam is taken. The medical schools strongly urge applicants to complete the MCAT by April of the year in which they are applying so that evaluation of the application will not be delayed.

**Veterinary Medicine** The UC Davis School of Veterinary Medicine requires a course in statistics (e.g., STAT 100A), genetics (e.g., BIOL 102), physiology (e.g., BIOL 171 and BIOL 171L) and embryology or development (e.g., BIOL 168, CBNS 169). The Western University of Health Sciences (Pomona, CA) requires the following for admission to its School of Veterinary Medicine: microbiology (BIOL 121/MCBL 121, BIOL 121L/MCBL 121L), nutrition (e.g., BCH 010), genetics (BIOL 102), computer skills (e.g., CS 008), technical writing (e.g., ENGL 01SC), public speaking (THEA 050) and macroeconomics (e.g., ECON 002).

**Physical Therapy, Physician's Assistant, Public Health, Nutrition, Nursing, Occupational Therapy, Dental Hygiene** In most of the schools that have specializations in these areas, the clinical/professional training is at the graduate level. Preparatory course work and a baccalaureate degree can be obtained at UCR, with application to the desired graduate program. Each professional school may have specific requirements that must be met in the undergraduate years, in addition to the courses required for all UCR biology students (e.g., English composition, humanities and social sciences, science and mathematics core curriculum). In their second or third year at UCR, students interested in the above professional schools and careers should attend one of the orientation meetings held by the Medical and Health Careers Program Advisor. Practical volunteer or paid work experience is required or helpful for admission to these programs, especially physical therapy and

physician's assistant. Visit the internship coordinator (Career Services, Veitch Student Center) to arrange volunteer work at local institutions.

For some of the above specializations, clinical training is provided as part of an undergraduate curriculum. For a certificate or baccalaureate degree in nursing, nutrition, dental hygiene, or physician's assistant, students are well-advised to enroll initially in a school with the specific undergraduate program they want. Students can take some of the preparatory course work (e.g., English composition, introductory biology, chemistry) at UCR for such programs and then transfer, but this may increase the overall time to get the certificate or degree. Students wishing to obtain their degree at UCR before transferring should select additional upper-division course work in biology and related fields appropriate for the desired professional school and career objective.

**Laboratory Technology** Students who plan to apply to a laboratory technology school must obtain a Clinical Laboratory Scientist Trainee license, which certifies that they have completed the required courses for admission to a training program. In addition to the courses required in the core curriculum, the following courses are required by the California State Department of Health for a trainee license in Clinical Laboratory Science:

Biochemistry: BCH 100 or BCH 110A

Microbiology: BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 124/MCBL 124

Immunology: BIOL 128/CBNS 128

Human anatomy/physiology: BIOL 171, BIOL 171L

Quantitative analysis: CHEM 005

Hematology

Students should inquire at the CNAS Academic Advising Center (1223 Pierce Hall) concerning hematology, since a separate course is not available at UCR.

For admission to training laboratories approved by the American Medical Association, students must have one year of organic chemistry. This is completed as part of the core curriculum for the life science majors and tracks. Statistics (e.g., STAT 100A, STAT 100B) and parasitology (BIOL 157) are strongly recommended. Preparation is further strengthened with courses in cell and molecular biology (e.g., BIOL 107A, CBNS 101).

The Medical and Health Careers Program Advisor and Career Services staff can provide information about laboratory technology schools. For current information regarding requirements for clinical training and applications for the Clinical Laboratory Scientist Trainee License (required for admission to any laboratory technology program), students should call (510) 873-6327, or write State of California Department of Health, Laboratory Field Services, 2151 Berkeley Way, Annex 12, Berkeley, CA 94704.

## Education and Research Centers, Institutes, and Resources

Undergraduate students benefit greatly from the rich variety of centers, institutes, natural reserves and other research facilities that are part of UCR. Each center or institute has research and teaching focused on a specific area of science or engineering or a specific aspect of culture, behavior, or society. Faculty associated with these resources provide courses, field trips and opportunities for undergraduate research and part-time employment. The Research Opportunities section of this catalog has information and Web sites for the examples below and other centers and institutes at UCR.

Center for Ideas and Society:

**IdeasAndSociety.ucr.edu**

UC Institute for Mexico and the United States:

**ucmexus.ucr.edu**

Center for Conservation Biology: **ccb.ucr.edu**

UCR Institute for Integrative Genome Biology: **genomics.ucr.edu**

Center for Plant Cell Biology: **cepceb.ucr.edu**

UCR Botanic Gardens: **gardens.ucr.edu**

UCR Natural Reserve System:

**biology.ucr.edu/about\_us/nrs.html**

## Upper-Division Courses

**BLSC 192H. Junior Honors Seminar (2)** Seminar, 2 hours. Prerequisite(s): junior standing in the Biological Sciences major; admission to the upper-division University Honors Program or consent of instructor. Involves presentations of research programs by individual faculty members; discussions of readings provided by faculty members; research conceptualization and design, and written and oral scientific communication methods; and peer exchanges and peer mentoring. Satisfactory (S) or No Credit (NC) grading is not available.

**BLSC 193H. Senior Honors Seminar (2)** Seminar, 2 hours. Prerequisite(s): senior standing in the Biological Sciences major; admission to the upper-division University Honors Program or consent of instructor. Discussion of senior thesis writing procedures, including data analysis and presentation, and written and oral scientific communication methods by faculty who are sponsoring honors thesis research. Satisfactory (S) or No Credit (NC) grading is not available.

**BLSC 195H. Senior Honors Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): BLSC 198H; senior standing in the Biological Sciences major; admission to the upper-division University Honors Program or consent of instructor. Students complete research in the biological sciences and write a senior honors thesis under the guidance of a faculty member of the Biological Sciences interdepartmental major. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 9 units.

**BLSC 198H. Junior Honors Research (1-4)** Laboratory, 3-12 hours. Prerequisite(s): junior standing in the Biological Sciences major; admission to the upper-division University Honors Program or consent of instructor. Students investigate special problems and conduct research in the biological sciences under the guidance of a faculty member of the Biological

Sciences interdepartmental major. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 9 units.

## Biology

**Subject abbreviation: BIOL**

**College of Natural and Agricultural Sciences**

Bradley C. Hyman, Ph.D., Chair  
Department Office, 2745 Life  
Sciences/Psychology Bldg.  
(951) 827-5703; [biology.ucr.edu](http://biology.ucr.edu)

### Professors

Michael F. Allen, Ph.D. (Biology/Plant Pathology)  
Richard A. Cardullo, Ph.D.  
Mark A. Chappell, Ph.D.  
Daphne Fairbairn, Ph.D.  
Theodore Garland, Jr., Ph.D.  
Leah T. Haimo, Ph.D.  
Kimberly A. Hammond, Ph.D.  
Cheryl Y. Hayashi, Ph.D.  
Bradley C. Hyman, Ph.D.  
Dmitri Maslov, Ph.D.  
Leonard P. Nunney, Ph.D.  
David N. Reznick, Ph.D.  
Derek A. Roff, Ph.D.  
John T. Rotenberry, Ph.D.  
Mark S. Springer, Ph.D.  
Timothy P. White, Ph.D.  
Marlene Zuk, Ph.D.

### Professors Emeriti

Carlton R. Bovell, Ph.D.  
Roger D. Farley, Ph.D.  
Wilbur W. Mayhew, Ph.D.  
Edward G. Platzer, Ph.D. (Biology/Nematology)  
Mary V. Price, Ph.D.  
Rodolfo Ruibal, Ph.D.  
Clay A. Sassaman, Ph.D.  
Irwin W. Sherman, Ph.D.  
Nickolas M. Waser, Ph.D.

### Associate Professors

John Gatesy, Ph.D.  
Morris F. Maduro, Ph.D.  
Helen M. Regan, Ph.D.  
Wendy G. Saltzman, Ph.D.

### Assistant Professors

Kurt Anderson, Ph.D.  
Timothy E. Higham, Ph.D.  
Joel L. Sachs, Ph.D.

\*\*

### Lecturer

Tracy L. Kahn, Ph.D.

### Cooperating Faculty

Khaleel Abdulrazak, Ph.D. (Psychology)  
Edith B. Allen, Ph.D. (Botany and Plant Sciences)  
James G. Baldwin, Ph.D. (Nematology)  
Ring T. Carde, Ph.D. (Entomology)  
Paul DeLey, Ph.D. (Nematology)  
Mary L. Droser, Ph.D. (Earth Sciences)  
Norman C. Ellstrand, Ph.D. (Botany and Plant Sciences)  
J. Daniel Hare, Ph.D. (Entomology)  
John M. Heraty, Ph.D. (Entomology)  
Nigel C. Hughes, Ph.D. (Earth Sciences)  
Darrel Jenerette, Ph.D. (Botany and Plant Sciences)  
Seung-Chul Kim, Ph.D. (Botany and Plant Sciences)  
Sang-Hee Lee, Ph.D. (Anthropology)  
Timothy D. Paine, Ph.D. (Entomology)  
Richard A. Redak, Ph.D. (Entomology)  
Louis Santiago, Ph.D. (Botany and Plant Sciences)  
Richard Stouthamer, Ph.D. (Entomology)

William E. Walton, Ph.D. (Entomology)

## Major

The Department of Biology offers B.A. and B.S. degrees in Biology. Both programs are based on the conviction that broad undergraduate training in biology, mathematics and the physical sciences, together with study in the humanities and social sciences, are fundamental to the education of a biologist. In addition to English composition, humanities, social sciences and the Life Sciences core curriculum (see below, Major Requirements), both degrees require 36 units of upper-division (numbered 100-199) biology courses. The degrees differ in the humanities and social sciences requirements; also 16 units of a foreign language are required for the B.A., whereas the B.S. requires 16 additional units in substantive courses in biology or related fields.

The research and teaching of the Department of Biology includes different levels (e.g., molecules, cells, organisms, populations, communities) and processes (e.g., development, evolution) of biological organization. An overview is presented in the introductory courses (BIOL 005A, BIOL 05LA, BIOL 005B, and BIOL 005C), and emphasis is placed on the unifying principles of the discipline.

Because of the diversity within biology and the wide range of career options, much latitude is allowed in selecting upper-division biology courses for the 36 units required for the major. Each student can select courses and plan a program of study to meet her/his specific interests and career goals. For assistance with this, faculty advisors are available in the CNAS Academic Advising Center (1223 Pierce Hall, (951) 827-7294). The section below, Programs of Specialization, is provided as a guide for course selection for graduate schools, medical and health science professional schools and the broad range of careers that are possible with the Biology major.

The 36 upper-division units are selected from a list which includes courses offered by the Department of Biology (BIOL 100-199) and a limited number of courses in Biochemistry (BCH), and Cell Biology and Neuroscience (CBNS). Qualified undergraduates (GPA 3.0 or above) may participate in graduate-level biology seminar courses with consent of the instructor, and up to 4 units (with letter grade) may be included in the major.

Those who choose to obtain a B.S. degree have as a college requirement an additional 16 units in upper-division biology courses and/or substantive courses in a field or fields related to the major. The purpose of this related area is to add strength and breadth to the major and to meet specific requirements for postgraduate study or a chosen career. The substantive courses in fields related to the major may be lower or upper division, but they usually have science or mathematics prerequisites (e.g., CBNS 120/PSYC 120, CHEM 005, STAT 100A, STAT 100B, MATH 009C).

### UCR/UCLA Thomas Haider Program in

**Biomedical Sciences** Students in the Biology major and all others at UCR are eligible to complete admission requirements and apply for the 24 positions reserved for UCR students in the joint UCR/UCLA Thomas Haider Program in Biomedical Sciences. The first two years of medical school are taken at UCR, while the next two (clinical) years are completed at medical facilities at or associated with UCLA (Geffen School of Medicine). Information is provided at [www.biomed.ucr.edu](http://www.biomed.ucr.edu), in the program's section of this catalog, in the Student Affairs Office for the program (B600 Stat-Comp, (951) 827-4334), and at orientation meetings held at UCR.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

## Major Requirements

Some of the following requirements for the major in Biology may also fulfill the College's breadth requirements. Consult with a department advisor for course planning.

- Life Sciences core curriculum (68-72 units)
  - BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C
  - CHEM 112A, CHEM 112B, CHEM 112C
  - MATH 008B or MATH 009A, MATH 009B
  - PHYS 002A, PHYS 002B, PHYS 002C, PHYS 021A, PHYS 021B, PHYS 021C
  - STAT 100A
  - BCH 100 or BCH 110A

The core curriculum must be completed with a grade point average of 2.0 or better and no grade lower than "C-." If a grade of D or F is received in two core curriculum courses, either in separate courses or repetitions of the same course, the student will not be permitted to continue in the major.

- Upper-division requirements (36 units)
  - BIOL 102
  - Thirty-two (32) additional Biology units to be taken in consultation with a faculty advisor
- Other requirements

### For the Bachelor of Arts only (0-16 units):

The foreign language requirement may be fulfilled by completing level four or the demonstration of equivalent proficiency in one foreign language.

### For the Bachelor of Science only (16 units):

An additional 16 units in upper-division biology courses and/or substantive courses in a field or fields related to the major. A list of acceptable courses is available in the CNAS Academic Advising Center.

## Programs of Specialization

The Life Sciences core curriculum (item 1 above) fulfills many of the requirements for admission to graduate schools in biology or professional schools in the medical and health science fields. In addition to Introductory Genetics (BIOL 102, 4 units), a wide choice is available for the remaining 32 upper-division units required for the Biology major (item 2.b above) and the 16 additional units related to the field of the major (B.S. degree, item 3 above). Each student selects upper-division and related courses depending on the type of school and career chosen (e.g., education, medicine, pharmacy, dentistry, optometry, veterinary medicine, nursing, physical therapy, public health, graduate school in one of the fields below).

In planning an academic program to prepare for teaching or one of the medical fields, present and prospective Biology majors are referred to relevant topics in the Biological Sciences section of this catalog. That section has information for those planning to attend graduate school in education to obtain a teaching credential (subsection, Teaching Credential) and/or a master's or Ph.D. degree in education (subsection, Preparation for Graduate School). Also included are guidelines to help students select courses to prepare for admission to professional schools in the medical field (subsections, Medical Biology, Suggestions for Elective Units for Medical/Health Professions, Admission Requirements for Medical and Health Professional Schools). Additional information about required course work and admission tests (MCAT, OAT, VCAT, PCAT, GRE) can be obtained from Career Services (Veitch Student Center) and the Medical and Health Careers Program (visit 1114 Pierce Hall or [mhcp.ucr.edu](http://mhcp.ucr.edu)).

Suggested courses of study are provided below for those interested in various biological fields. These programs meet most of the requirements for admission to corresponding graduate schools for those students who wish to pursue a master's and/or Ph.D. degree. The faculty advisor assists in selecting combinations of courses appropriate for advanced study in the fields below and others. Students considering graduate study are encouraged to do undergraduate research and take courses in computer science and statistics.

In some cases, a course of study differing substantially from the examples given below will best meet the needs of the student. In consultation with a faculty advisor, a student may prepare a program in some other biological specialization such as animal behavior, evolution/development or developmental biology.

**Cell and Molecular Biology** BIOL 102, BIOL 105, BIOL 107A, BIOL 107B, BIOL 109 or BIOL 153/BCH 153/BPSC 153, CBNS 101 or BIOL 113 and BIOL 114, BIOL 119, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 122/MCBL 122, BIOL 123/MCBL 123/

PLPA 123, BIOL 124/MCBL 124, BIOL 128/CBNS 128, BIOL 155/BPSC 155, BIOL 168, BCH 100 or the BCH 110A, BCH 110B, and BCH 110C sequence, BCH 102, CBNS 108, CBNS 150/ENTX 150, CHEM 005, CHEM 109, STAT 100A and STAT 100B

**Ecology and Population Biology** BIOL 102, BIOL 104/BPSC 104, BIOL 105, BIOL 108, BIOL 116, BIOL 116L, BIOL 117, BIOL 160, BIOL 160L, BIOL 174, either BIOL 175 or BIOL 143/BPSC 143, the MATH 008B or MATH 009A, MATH 009B, and MATH 009C sequence, STAT 100A and STAT 100B. Also recommended: BIOL 151, BIOL 161A, BIOL 163, BPSC 146, MATH 046, BIOL 165/BPSC 165, BIOL 166

**Molecular Genetics** BIOL 102, BIOL 105, BIOL 107A, BIOL 107B, BIOL 108, BIOL 109 or BIOL 153/BCH 153/BPSC 153, BIOL 115, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 122/MCBL 122, BIOL 123/MCBL 123/PLPA 123, BIOL 128/CBNS 128, BIOL 155/BPSC 155, BIOL 168, CBNS 108, CBNS 150/ENTX 150, CBNS 169

**Zoology and Physiology** BIOL 100/ENTM 100, BIOL 102, BIOL 105, CBNS 101 or BIOL 113 and BIOL 114, BIOL 151, BIOL 152/GEO 152, BIOL 157, BIOL 159, BIOL 160, BIOL 160L, BIOL 161A, BIOL 161B, BIOL 162/ENTM 162, BIOL 168, BIOL 171, BIOL 171L, BIOL 173/ENTM 173, BIOL 174, BIOL 175, BIOL 178, BCH 100, CBNS 106, CBNS 108, CBNS 116, CBNS 169. Students are also encouraged to take laboratory courses (e.g., BCH 102). Also recommended: a course in ecology (e.g., BIOL 116, BIOL 116L), STAT 100A and STAT 100B

**California Teach-Science/Mathematics Initiative (CaTEACH-SMI)** California Teach-Science Mathematics Initiative (CaTEACH-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CaTEACH-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the SMI & Alpha Center Apprentice Programs, to explore STEM teaching as a career option. Through CaTEACH-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CaTEACH-SMI Resource Center provides future STEM teachers with material and financial resources which includes the National Science Foundation (NSF) Noyce Scholarship Program to promote planning and professional development towards a science/mathematics education career.

For more information about the CaTEACH-SMI program, please visit <http://smi.ucr.edu> or at the Resource Center at 1315 Pierce Hall.

## Additional Curricular and Advising Information

This catalog has sections applicable for all students at UCR (Finances and Registration, Academic Regulations), and a specific section for students in this college (College of Natural and Agricultural Sciences). Present and prospective students are referred to those sections for enrollment policies and procedures and curricular and advising information for the campus and college.

The Biological Sciences section has topics especially relevant and helpful for students in that major and the departmental majors in Biology, Plant Biology, and Neuroscience. Present and prospective students are referred to the following subheadings in the Biological Sciences section:

- Student Academic Advising
- Grading Basis: Letter Grade or S/NC
- Full or Part-time Study
- Transfer Students
- Minor
- Double Major
- Internships
- Teaching Credential
- Preparation for Graduate School
- Suggestions for Elective Units for Medical/Health Professionals
- Admission Requirements for Medical and Health Professional Schools
- Education and Research Centers, Institutes and Resources

## Independent Study and Research

The Department of Biology offers courses in which students can enroll to do independent laboratory research or an in-depth library study of a topic of special interest.

Students desiring to do Independent Reading (BIOL 194), Introduction to Research (BIOL 197) or Junior/Senior Research (BIOL 199) should consult with a professor who is willing to supervise the project. The student may suggest a specific question or formulate a project after consultation with the instructor. Information about the research fields of the professors is available at the CNAS Academic Advising Center (1223 Pierce Hall).

To enroll in these courses, the student must obtain an application form from the Biological Sciences Undergraduate Advising Center. Instructions for writing a brief description of the proposed project are provided with the form. The completed application, signed by the professor in charge of the project, is submitted to the advising center preferably before the first day of the quarter but no later than the end of the second week of the quarter.

Applicants for BIOL 194 and BIOL 199 should ordinarily be juniors or seniors with a GPA of 3.00 or higher. Sophomore students with a GPA

of 3.00 or higher may apply to enroll in BIOL 197 (Introduction to Research), since the purpose of this course is to enable the student to do preliminary reading and laboratory research to explore with the professor the feasibility of undertaking a project for later enrollment in BIOL 199. Enrollment in BIOL 197 is not required before enrollment in BIOL 199, but the former course is available for those situations where preliminary work will be helpful.

For BIOL 194 and BIOL 199, the student writes a report of the library study or laboratory results for the quarter, which is reviewed by the sponsoring professor and submitted to the CNAS Academic Advising Center by the last day of instruction of the quarter.

BIOL 194, BIOL 197, and BIOL 199 are graded "S/NC", and up to 9 units of credit may be counted as part of the 16 substantive units related to the major for the B.S. degree.

## Natural Reserve System

This system was formed by the UC in 1965 to preserve for study a series of undisturbed natural areas representing the state's vast ecological diversity. Since then the system has grown to include thirty-seven reserves, eight of them administered by the UCR campus. See Research Opportunities in this catalog.

Most of the reserves are undeveloped except for fencing, roads and trails, but laboratory facilities, housing and campgrounds for class use are available at some sites. The reserves are used as outdoor classrooms and laboratories by students, teachers and researchers from educational institutions, public and private, throughout the state, across the nation and around the world. Some of the courses offered by the UCR Department of Biology include field trips and overnight camping trips to the reserves. In the field, students are introduced to the great diversity of plant and animal organisms in Southern California, and to the effect of environmental factors on this diversity.

Undergraduate and graduate students who wish to use the reserves in their individual research projects should contact Dr. John T. Rotenberry, Department of Biology, 3372 Spieth Hall, (951) 827-3953, to obtain an application, map and list of rules and regulations.

## Graduate Program

The Department of Biology administers programs leading to the M.S. and Ph.D. degrees in Evolution, Ecology, and Organismal Biology, with specializations in Evolutionary Biology, Ecology, and Physiology and Biophysics.

**Admission** Applicants must submit GRE scores for the General Test (verbal, quantitative, and analytical). In addition, submission of the Subject Test score may improve chances of admission and is recommended.

All graduate students entering the department meet with a guidance committee during

the first quarter of enrollment so that their educational background can be addressed. Considering the requirements of the student's specialization, the committee recommends a program of study to be followed in pursuit of graduate work. Because of the diversity among the specializations, course requirements for advanced degrees are specified by the student's guidance committee in accordance with the specific requirements of each track.

## Doctoral Degree

The Department of Biology offers the Ph.D. degree in Evolution, Ecology, and Organismal Biology, with specializations in Evolutionary Biology, Ecology, and Physiology & Biophysics. In addition to the general requirements of the Graduate Division, students intending to become candidates for the Ph.D. degree in Evolution, Ecology, and Organismal Biology must complete the following.

**Course Work** Course requirements are determined in consideration of the requirements of the student's area of specialization. Selection of specific courses is done by the guidance committee in consultation with the student.

Each track requires EEOB 400, two 200-level disciplinary courses, a core course (or core course series) and two current research topics courses: EEOB 265 and a disciplinary colloquium series seminar (BIOL 252 or equivalent).

### A. Evolutionary Biology

1. Disciplinary core course in Evolutionary Theory (EEOB 216 or the equivalent)
2. At least two disciplinary courses (EEOB 211, BIOL 212/ENTM 212/GEO 212, EEOB 213, EEOB 214 EEOB 217, EEOB 219)
3. Two current research topics courses (BIOL 252 or another disciplinary colloquium and EEOB 265), each for a minimum of 5 quarters prior to advancement to candidacy and a total of 12 quarters prior to completion of the doctoral degree.

### B. Ecology

1. Disciplinary core course in Ecology (EEOB 211)
2. At least two disciplinary courses (BIOL 212/ENTM 212/GEO 212, EEOB 213, EEOB 217, BPSC 246, BPSC 247, BPSC 243, ENSC 232, SWSC 211/MCBL 211)
3. Two current research topics courses (BIOL 252 or another disciplinary colloquium and EEOB 265), each for a minimum of 5 quarters prior to advancement to candidacy and a total of 12 quarters prior to completion of the doctoral degree.

### C. Physiology and Biophysics

1. Disciplinary core course in Physiology (EEOB 297; two units each in the first four quarters of residence for a total of 8 quarters)

2. At least two disciplinary courses (CMDB 200 or CBNS 200A, CMDB 201, CBNS 200B, CMDB 202, CBNS 200C, BIOL 203, EEOB 216, ENTM 201, ENTM 243)
3. Two current research topics courses (BIOL 252 or another disciplinary colloquium and EEOB 265), each for a minimum of 5 quarters prior to completion of the doctoral degree.

### Written and Oral Qualifying Examinations

Students must pass a written examination in their specialized field of interest not later than the end of the second year of residence. Written Qualifying Examinations must be completed by the eighth week of the sixth quarter in residence for each track. Upon successful completion of the Written Qualifying Examination, an Oral Qualifying Examination is administered wherein students defend a proposal detailing the rationale, specific aims, and approaches to be undertaken for their proposed dissertation research.

**Dissertation** Candidates may be required to successfully defend their dissertation research in a public oral presentation.

**Teaching Requirement** Students must have at least one year of approved teaching experience.

**Normative Time to Degree** 18 quarters

## Master's Degree

The Department of Biology offers the M.S. degree in Evolution, Ecology, and Organismal Biology, with specializations in Evolutionary Biology, Ecology, and Physiology & Biophysics. To qualify for the M.S. degree in Evolution, Ecology, and Organismal Biology, candidates must meet the requirements of the Department of Biology.

These requirements are as follows:

**Plan I (Thesis)** Thirty-six (36) quarter units of approved courses in the 100 or 200 series, of which at least 24 units must be in the 200 series courses in the biological sciences. Not more than 12 units of EEOB 299 may be applied to the degree. A minimum of 12 units of course work other than courses in the 290 series must be completed in fulfillment of the requirement for 24 units of graduate courses. Students must present an acceptable thesis and undergo a final oral examination in defense of the thesis.

## Lower-Division Courses

**BIOL 002. Cellular Basis of Life (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. An introduction to the fundamentals of life processes at the cellular level. Topics include cell structure, chemical composition, metabolism, reproduction, genetics, and development with emphasis on humans. Not recommended for natural science majors. Either BIOL 002 or BIOL 003 may be taken as a breadth requirement in biology; together they provide a general introduction to the field of biology. Credit is not awarded for BIOL 002 if it has already been awarded for BIOL 005A or BIOL 05LA.

**BIOL 003. Organisms in Their Environment (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. An introduction to the physiology, ecology, and evolution of living organisms with emphasis on humans. Not recommended for natural science majors. Either BIOL 002 or BIOL 003 may be taken as a breadth requirement in biology; together they provide a general introduction to the field of biology. Credit is not allowed for both BIOL 003 and BIOL 005B.

**BIOL 005A. Introduction to Cell and Molecular Biology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 05LA (may be taken concurrently); CHEM 001A and CHEM 01LA with grades of "C-" or better or CHEM 01HA and CHEM 1HLA with grades of "C-" or better; consent of instructor is required for students repeating the course. An intensive course designed to prepare students for upper-division courses in cell and molecular biology. Covers biochemical, structural, metabolic, and genetic aspects of cells. (Required for Biology majors; recommended for science majors desiring an introduction to biology.) Credit is not awarded for BIOL 005A if it has already been awarded for BIOL 002.

**BIOL 05LA. Introduction to Cell and Molecular Biology Laboratory (1)** Laboratory, 3 hours. Prerequisite(s): BIOL 005A (may be taken concurrently); consent of instructor is required for students repeating the course. An introduction to laboratory exercises on fundamental principles of and techniques in cell and molecular biology. Illustrates the experimental foundations of the topics covered in BIOL 005A. Credit is not awarded for BIOL 05LA if it has already been awarded for BIOL 002.

**BIOL 005B. Introduction to Organismal Biology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A and BIOL 05LA with grades of "C-" or better; CHEM 001A or CHEM 01HA; CHEM 001B or CHEM 01HB; consent of instructor is required for students repeating the course. An intensive course designed to prepare students for upper-division courses in organismal biology. Covers developmental biology, physiology, and regulation at the level of the organism. (Required for Biology majors; recommended for science majors desiring an introduction to biology.) Credit is awarded for only one of BIOL 003 or BIOL 005B.

**BIOL 005C. Introductory Evolution and Ecology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A and BIOL 005B (or BIOL 002 and BIOL 003 for non-Biology majors) with grades of "C-" or better; MATH 008B with a grade of "C-" or better or MATH 009A with a grade of "C-" or better or equivalent; consent of instructor is required for students repeating the course. An intensive introduction to the subjects of evolution and ecology. Covers population dynamics, community ecology, population genetics, and evolutionary theory. Recommended for science majors desiring an introduction to biology. Students who take equivalent first-year biology at another institution may enter directly into BIOL 005C without critical handicap.

**BIOL 010. Headlines in the History of Life (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. Evolution of life beginning with precellular life. Topics include the origin of sex; multicellularity; vertebrate classes; morphological specializations; adaptive radiations; extinction dynamics; and the biology of dinosaurs. Cross-listed with GEO 003.

**BIOL 020. Dynamic Genome (2) F** Laboratory, 6 hours. Prerequisite(s): CHEM 001A, ENGL 001A, MATH 009A (may be taken concurrently), NASC 092 or NASC 093 (may be taken concurrently); freshman standing. Introduces computational and experimental approaches in investigating the genomes of plants

and animals. Explores scientific discovery using the tools of bioinformatics and genomics. Includes participation in research projects being conducted on campus. **Wessler**

**BIOL 030. Human Reproduction and Sexual Behavior (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A consideration of human anatomy, physiology and behavior as related to sexual reproduction, including discussion of fertility, pregnancy, childbirth and birth control. Consideration will also be given to homosexuality, venereal diseases, sex education, sexual intercourse and response.

**BIOL 034. Human Heredity and Evolution (4)** Lecture, 3 hours; discussion and problem solving, 1 hour; audio-visual aids plus discussion, 1 hour. Basic human genetics and evolution, emphasizing their relationship to physical and emotional health. Political, philosophical and ethical implications of human heredity and evolution.

**BIOL 040. Disease and History: From the Bubonic Plague to AIDS (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. This lecture course for non-science majors will deal with the natural history of infectious diseases and how plagues have influenced the course of human history. It will cover the biology, pathology, epidemiology, and immunology of viruses, bacteria, and protozoan parasites causing smallpox, yellow fever, influenza, AIDS, syphilis, bubonic plague, tuberculosis, leprosy, malaria, and African sleeping sickness. The role of scientific inquiry in the conquest of human disease will be emphasized.

## Upper-Division Courses

**BIOL 100. General Entomology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BIOL 005C, or equivalents; or consent of instructor. Introductory study of insects, Earth's most diverse group of animals (75 percent of animal species are insects). Lecture covers the anatomy, physiology, ecology, behavior, and diversity of insects. Laboratory focuses on insect identification. Cross-listed with ENTM 100.

**BIOL 102. Introductory Genetics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A and BIOL 005B with grades of "C-" or better. An introductory course, including classical Mendelian genetics, linkage and recombination, sex-linked traits, cytogenetics, developmental genetics, and molecular genetics. Also includes some probability theory and statistics.

**BIOL 104. Foundations of Plant Biology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C. A study of the plant world from cells to ecosystems. Examines the structure and function of organisms from the major plant groups and their role in the biosphere. The laboratory explores the unique properties of plants. Cross-listed with BPSC 104.

**BIOL 105. Evolution (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of "C-" or better, BIOL 102, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. Covers the causal interpretation of organic diversity and adaptation. Topics include inference of evolutionary change from the fossil record and from genomic and molecular patterns; microevolution and macroevolution; systematics and the species problem; and natural selection, drift, and other forces of evolution.

**BIOL 106. Biology of Human Variation (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102; BIOL 105 or BIOL 108; STAT 100B (STAT 100B may

be taken concurrently); or consent of instructor. A survey of variation within and among contemporary human populations arising from genetic and environmental factors. Covers single-locus and polygenic inheritance, developmental plasticity, and physiological acclimatization. Includes biogeographic and demographic influences; variation in pigmentation, stature, physiology, disease susceptibility, behavior, and IQ; and critical evaluation of racial and ethnic classifications.

**BIOL 107A. Molecular Biology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A. The study of the structure and function of the genetic material, including DNA structure, DNA replication and recombination, regulation of gene expression, and protein synthesis. Both prokaryotic and eukaryotic systems are examined, including contemporary recombinant DNA technology and applications of molecular cloning procedures.

**BIOL 107B. Advanced Molecular Biology (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or BCH 110C or equivalents. An advanced treatment of the functional architecture of genetic material. Topics include genome structure and chromosome organization, DNA replication and gene expression, cloning organisms, molecular medicine, protein engineering, and application of modern molecular biology to agricultural problems. Coverage of each topic includes discussion of the impact of the emergent molecular technology on society.

**BIOL 108. Introductory Population Genetics (4)** Lecture, 3 hours; discussion and demonstration, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, one course in statistics. A study of the factors influencing the genetic structure of natural populations. Topics discussed include the incidence of genetic disease, inbreeding, conservation genetics, molecular evolution, adaptation in a changing environment, and how natural selection acts at different levels of organization.

**BIOL 110. Biology of Human Problems (4)** Seminar, 4 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. Devoted to selected human problems that have a large biological component and that relate to medicine, ethics, and human existence. Topics covered vary from year to year and include issues of major bioethical importance such as euthanasia, national health care, effects of industrial pollution on individuals and communities, population problems, abortion, and genetic engineering.

**BIOL 111. Infectious Disease Epidemiology (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, and BIOL 005C with a grade of "C-" or better, BIOL 102 with a grade of "C-" or better, STAT 100A or equivalent (or consent of instructor) with a grade of "C-" or better. Introduces epidemiological methods used to investigate infectious diseases. Includes examples and case studies presented for a variety of human infectious diseases. **Walter**

**BIOL 112. Systematics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification: phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchy of categories, and nomenclature. Cross-listed with BPSC 112 and ENTM 112.

**BIOL 113. Advanced Cell Biology: Membranes, Organelles, and the Cytoskeleton (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, BIOL 102, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. An examination of the organization, function, and behavior of eukaryotic cells. Topics include membrane systems, protein targeting, the cytoskeleton, motility, and cell division. Emphasis is on the experiments that form the basis of the current understanding of the cell. Students read original journal articles, an analysis of which is the focus of the discussion section.

**BIOL 114. Advanced Cell Biology: Cellular Reproduction and Signaling (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, BIOL 102, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. An examination of the organization, function, and behavior of eukaryotic cells. Explores the molecular mechanisms used by cells to control reproduction, growth, and responses to extracellular signals. Emphasis is on experiments that form the basis of the current understanding of the cell. Students read original journal articles, an analysis of which is the focus of the discussion section.

**BIOL 115. Human Genetics (3)** Lecture, 3 hours. Prerequisite(s): BCH 110A; BCH 110B; BCH 110C or BIOL 107A (may be taken concurrently); BIOL 121/MCBL 121; STAT 100A or equivalent; or consent of instructor. An introduction to human genetics. Topics include human gene organization and expression, chromosome structure, karyotyping, chromosomal aberrations, sex determination and sex chromosome abnormalities, patterns of single gene inheritance, linkage analysis, human gene mapping, inborn errors in metabolism, human population genetics, polymorphic cell surface antigens, multifactorial inheritance genetics of cancer, prenatal diagnosis, and uses of recombinant DNA in medical genetics.

**BIOL 116. Ecology and Conservation Biology (4)** Lecture, 3 hours; discussion, 7 hours per quarter; field, 9 hours per quarter. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, MATH 009B or MATH 09HB; or consent of instructor. Introduces principles of ecology with emphasis on implications for the conservation of biodiversity. Topics include physiological ecology, organismal adaptations to the environment, life histories, the niche concept, population growth, interspecific interactions, and the structure and functioning of communities and ecosystems. Also covers topics in applied ecology and conservation biology. An optional related laboratory course, BIOL 116L, is available.

**BIOL 116L. Laboratory in Ecology and Conservation (2)** Lecture, 1 hour; laboratory, 1.5 hours; field, 1.5 hours. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, BIOL 116 (BIOL 116 may be taken concurrently), CHEM 001C or CHEM 01HC, MATH 009B or MATH 09HB, STAT 100A (STAT 100A may be taken concurrently). Offers laboratory and field exercises in ecology and conservation. Students design, execute, and analyze several projects that explore topics such as population dynamics, life tables, abundance and distribution, succession, diversity, conservation, and restoration.

**BIOL 117. Population and Community Ecology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, BIOL 116, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. Introduces models of population growth, interspe-

cific interaction, and biotic communities and their implications for applied fields such as pest control, epidemiology, and conservation of biodiversity. Topics include population growth and regulation, life history evolution, metapopulation dynamics, extinction, competition, predation, and the role of ecological interactions in adaptation and evolutionary change.

**BIOL 118. Laboratory in Molecular Phylogenetics and Evolution (4)** Lecture, 2 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BCH 100 or BCH 110A, BIOL 005C with a grade of "C-" or better, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, STAT 100A; or consent of instructor. Covers theory, techniques, and analytical methods for interpreting patterns of molecular evolution and phylogeny. Explores the comparative analysis of DNA and tests of evolutionary hypotheses using modern computational methods. Includes polymerase chain reaction (PCR), cloning, gel electrophoresis, and restriction site analysis.

**BIOL 119. Introduction to Genomics and Bioinformatics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, BIOL 102, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. Introduction to the science of genomics and bioinformatics, including genome integrated sequencing, database techniques, comparative and evolutionary genomics, and microarray analysis.

**BIOL 120. Introduction to Plant Pathology (3)** Lecture, 3 hours. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. An introduction to the study of plant diseases. Topics include diseases and disease-causing agents, host-pathogen interaction during disease development, and strategies for disease management. An optional, separate laboratory is offered. Cross-listed with MCBL 120 and PLPA 120.

**BIOL 120L. Introduction to Plant Pathology Laboratory (1)** Laboratory, 4 hours. Prerequisite(s): BIOL 005A, BIOL 005B; concurrent enrollment in BIOL 120/MCBL 120/PLPA 120 or consent of instructor; BIOL 121/MCBL 121 and BIOL 124/MCBL 124 recommended. Covers fundamentals in the use of laboratory instruments and techniques for the detection, isolation, and identification of representative infectious agents that cause disease in plants. Cross-listed with MCBL 120L and PLPA 120L.

**BIOL 121. Introductory Microbiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently); or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers evolutionary origins of metabolic diversity, bacterial and viral molecular genetics, and an introduction to microbial pathogenesis. Cross-listed with MCBL 121.

**BIOL 121L. Microbiology Laboratory (3)** Lecture, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 121/MCBL 121 with a grade of "C-" or better. Laboratory exercises in diagnostic bacteriology, basic virology, and epidemiology. Includes fundamental quantitative and diagnostic microbiological procedures, basic mechanisms of microbial genetic exchange, and a project examining bacterial epidemiology. Cross-listed with MCBL 121L.

**BIOL 122. Food Microbiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 121/MCBL 121 with a grade of "C-" or better; BIOL 121L/MCBL 121L. Covers spoilage and preservation of food; food quality and indicator organisms; the role of microorganisms in the production of dairy goods and fermented beverages; food-borne pathogens and microbiological production of toxins; and classical and modern molecular methods for detection of food microorganisms. Cross-listed with MCBL 122.

**BIOL 123. Introduction to Comparative Virology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. Considers viruses as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Compares the major groups of viruses to each other with respect to their biological and biochemical properties, molecular and genetic characteristics, and modes of replication. Cross-listed with MCBL 123 and PLPA 123.

**BIOL 124. Pathogenic Microbiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 121/MCBL 121 with a grade of "C-" or better or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers research strategies for examining microbial pathogenic mechanisms. Cross-listed with MCBL 124.

**BIOL 127. Insect Ecology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. Introduces principles of insect ecology with examples emphasizing the Arthropoda. Topics include factors governing population growth; ecological and evolutionary interactions with hosts, competitors, and natural enemies; structure of ecological communities; and adaptations to different environments. Cross-listed with ENTM 127.

**BIOL 128. Immunology (3)** Lecture, 3 hours. Prerequisite(s): BIOL 005C; PHYS 002C; PHYS 02LC; BCH 100 or BCH 110A. A study of humoral and cellular immunology. Topics include lymphoid systems, cells, antigens, antibodies, antibody formation, cellular immunity, and tumor and transplantation immunology. Diseases and altered immune states associated with each topic are discussed in detail. Cross-listed with CBNS 128.

**BIOL 132. Plant Anatomy (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): BIOL 005A and BIOL 005B, or consent of instructor. Functional and developmental aspects of plant cell, tissue, and organ structure. All aspects of the flowering plant life cycle are covered from germination to pollination and fruit and seed development. Cross-listed with BPSC 132.

**BIOL 134. Introduction to Mycology (3)** Lecture, 3 hours. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. Introduction to the morphology, taxonomy, genetics, physiology, ecology, and economic importance of the major groups of the fungi. Cross-listed with PLPA 134.

**BIOL 134L. Introduction to Mycology Laboratory (1)** Laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, or equivalents; concurrent enrollment in BIOL 134/PLPA 134; or consent of instructor. Introduces fundamentals in the use of laboratory

instruments and techniques for the isolation, cultivation, and identification of representatives of the major taxa of fungi. Cross-listed with PLPA 134L.

**BIOL 138. Plant Developmental Morphology (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BIOL 005C, CHEM 112C, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently), PHYS 002C, PHYS 002LC; or consent of instructor. Introduces the key areas of research in plant morphology and developmental biology. Emphasizes flowering plants (angiosperms). Cross-listed with BPSC 138. **Smith, Springer**

**BIOL 143. Plant Physiology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently), BIOL 104/BPSC 104; or consent of instructor. A survey of the fundamental principles of plant physiology, including photosynthesis, respiration, water relations, mineral nutrition, growth, morphogenesis, plant hormones, dormancy, and senescence. Cross-listed with BPSC 143.

**BIOL 148. Quantitative Genetics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, BIOL 102, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, STAT 100B; or consent of instructor. Examines approaches to studying the genetic basis of polygenic, metric traits. Includes types of gene action, partitioning of variance, response to selection, and inferring the number and location of quantitative trait loci. Cross-listed with BPSC 148.

**BIOL 151. Invertebrate Zoology (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, PHYS 002A with grades of "C-" or better. Structure, classification, and biology of the invertebrates.

**BIOL 152. Principles of Invertebrate Paleobiology and Paleocology (4)** Lecture, 2 hours; laboratory, 3 hours; three 1-day field trips. Prerequisite(s): BIOL 005C with a grade of "C-" or better or BIOL 010/GEO 003 with a grade of "C-" or better. Topics include evolution and the fossil record, paleocology, classification theory, the nature of adaptive radiations, and extinctions. Cross-listed with GEO 152.

**BIOL 153. Plant Genomics and Biotechnology**

**Laboratory (4) F, Even Years** Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BCH 110C or BIOL 107A; upper-division standing; consent of instructor. A study of modern techniques in plant genome modification. Topics include nucleic acid cloning and sequencing; plant tissue culture and genetic transformation; controlled-environment plant growth; gene mapping; and germplasm collections. Also explores the history of plant biotechnology; economic, agricultural, nutritional, medicinal, and societal relevance; and regulatory issues. Cross-listed with BCH 153 and BPSC 153.

**BIOL 155. Chromosomes (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently); or consent of instructor. An examination of the structure, function, and behavior of eukaryotic chromosomes. Cross-listed with BPSC 155.

**BIOL 157. Parasitology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B,

BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, BCH 100 or BCH 110A, one course in statistics. Surveys the biology of protozoan and helminth interactions with their human hosts. **Platzer**

**BIOL 158. Medical Molecular Parasitology (4)** Lecture, 3 hours; seminar, 1.5 hours. Prerequisite(s): BCH 110C or BIOL 107A. An overview of genome organization and gene expression, with aspects of biochemistry, evolution, natural history, and clinical manifestations of human parasites *Trypanosoma*, *Leishmania*, *Plasmodium*, and others. Emphasizes the molecular and biochemical adaptations to parasitism. Prior knowledge of classical parasitology is not assumed. Students present original research papers during the seminar.

**BIOL 159. Biology of Nematodes (3)** Lecture, 2 hours; discussion and demonstration, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. An introduction to the biology of nematodes. Topics include the morphology, physiology, development, genetics, behavior, and ecology of nematodes from parasitic and free-living habitats. In the discussion and demonstration section, students observe the comparative morphology and biology of nematodes and give oral presentations on selected nematode life histories. Cross-listed with NEM 159.

**BIOL 160. Animal Behavior (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, and BIOL 102 with grades of "C-" or better, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. An examination of behavior from an evolutionary and ecological perspective. Topics include the inheritance of behavior, evolution of communication and displays, migration and habitat selection, foraging ecology, mating systems, and the evolution of social behavior.

**BIOL 160L. Laboratory in Animal Behavior (1)**

Laboratory, 4 hours. Prerequisite(s): BIOL 160 (may be taken concurrently). Laboratory and field exercises in animal behavior. Covers topics such as foraging behavior, aggression, and territoriality.

**BIOL 161A. Functional Anatomy of the Vertebrates (5)**

Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112A, MATH 009B or MATH 09HB, PHYS 002A, and one course in statistics with grades of "C-" or better. A study of the functional anatomy of vertebrates, including humans. Examines each organ system from a developmental and evolutionary perspective. Topics include phylogeny, the skeleton, muscles, and the nervous system. BIOL 161A, BIOL 161B, BIOL 171, and BIOL 171L provide a one-year sequence in vertebrate and human anatomy and physiology. Recommended for sophomores and juniors.

**BIOL 161B. Functional Anatomy of the Vertebrates (5)**

Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 161A, CHEM 112B, and PHYS 002B with grades of "C-" or better. A study of the functional anatomy of vertebrates, including humans. Examines each organ system from a developmental and evolutionary perspective. Topics include circulation, sense organs, the integument, and the respiratory, digestive, and urogenital systems. BIOL 161A, BIOL 161B, BIOL 171, and BIOL 171L provide a one-year sequence in vertebrate and human anatomy and physiology. Recommended for sophomores and juniors.

**BIOL 162. Insect Behavior (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C; or BIOL 100 /ENTM 100; or consent of instructor. An analysis of the mechanisms that cause and control behavioral reactions of insects. Emphasizes ethological and physiological knowledge concerning orientation mechanisms, communication systems, learning, and the role of the nervous system in integrating behavior in insects. Cross-listed with ENTM 162. **Carde**

**BIOL 163. Evolutionary Ecology of Terrestrial**

**Vertebrates (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. Topics include ecology, evolution, and behavior of birds, mammals, reptiles, and amphibians. Laboratory covers systematics, morphology, and identification, and includes field trips to local habitats.

**BIOL 165. Restoration Ecology (4)** Lecture, 3 hours; two 1-day field trips; three half-day field trips. Prerequisite(s): BIOL 104/BPSC 104 or BIOL 116 or ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; CHEM 112A; STAT 100A (STAT 100A may be taken concurrently); or consent of instructor. BIOL 102 and CHEM 112C are recommended. An examination of the basic ecological principles related to land restoration. Topics include enhanced succession, plant establishment, plant adaptations, ecotypes, weed colonization and competition, nutrient cycling, functions and reintroduction of soil microorganisms, restoration for wildlife, and the determination of successful restoration. Includes field trips to restored sites. Cross-listed with BPSC 165.

**BIOL 166. Conservation Ecology (3)** Lecture, 2 hours; field, 3 hours. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, BIOL 116, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, STAT 100A. PHYS 002C and PHYS 02LC are recommended. Introduces ecological concepts and strategies for conserving biodiversity. Covers topics ranging from genetics and evolution in small populations to community assembly, landscape structure, ecosystem processes, human impacts, and global change.

**BIOL 168. Developmental Biology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; a course in cell biology is recommended. An advanced description of the embryonic development of animals. Covers the basic concepts of fertilization, gastrulation, and neurulation. Analyzes topics in current developmental research, with an emphasis on the molecular mechanisms of pattern formation and differentiation.

**BIOL 171. Human Anatomy and Physiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 161A; CHEM 112C; MATH 009B or MATH 09HB; PHYS 002C; PHYS 02LC; BCH 100 or BCH 110A; one course in statistics; concurrent enrollment in BIOL 171L is recommended. An analysis of cell, tissue, and organ structure and function in normal and diseased conditions. Topics include the musculoskeletal, circulatory, and autonomic nervous systems; glands and hormones; body fluids and the kidney; digestion and absorption; and pharmacology and hematology. BIOL 161A, BIOL 161B, BIOL 171, and BIOL 171L provide a one-year sequence in vertebrate and human anatomy and physiology.

**BIOL 171L. Human Anatomy and Physiology Laboratory (1)** Laboratory, 3 hours. Prerequisite(s): BIOL 161A (may be taken concurrently), CHEM

112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; BIOL 161B is recommended; concurrent enrollment in BIOL 171. Involves laboratory experiments in physiology and study of human anatomy and histology (normal and diseased). Covers experimentation, data collection and analysis, incorporating hematology, blood proteins, urinalysis, neuromuscular control, cardiac excitation and pharmacology, blood pressure, electrocardiography, and electroencephalography. BIOL 161A, BIOL 161B, BIOL 171, and BIOL 171L provide a one-year sequence in vertebrate and human anatomy and physiology.

**BIOL 173. Insect Physiology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A and BIOL 005B or equivalents; CHEM 112A, CHEM 112B, CHEM 112C or equivalents; or consent of instructor. Introduction to principles of insect physiology. Subjects include growth, development and hormones, cuticle, nervous system, circulation, respiration, digestion, nutrition, excretion, reproduction, water balance, and temperature relations. Prior knowledge of insects is not assumed. Cross-listed with ENTM 173.

**BIOL 174. Ecological and Evolutionary Physiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. Examines the interactions between organisms and their environments, emphasizing coadaptation of physiological, morphological, and behavioral phenotypes. Includes allometry and scaling, metabolism and locomotion, heat and water exchange, evolution of endothermy, artificial selection experiments, and phylogenetically based statistical methods.

**BIOL 175. Comparative Animal Physiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; recommended: BIOL 151 or both BIOL 161A and BIOL 161B. Topics include nutrition and energy metabolism, gas exchange, circulation, and regulation of body fluid composition.

**BIOL 176. Comparative Biomechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; PHYS 002C or PHYS 040C; BCH 100 or BCH 110A. Applies principles from physics and engineering to the study of the relationship between organismal form and function. Covers examples from diverse plant and animal systems. Includes fundamental properties of solids and fluids, viscoelasticity, drag, biological pumps, locomotion, and muscle mechanics.

**BIOL 178. Hormones and Behavior (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. An examination of the interactions between hormones and behavior in animals, including humans. Provides an overview of endocrine physiology, and examines the roles of hormones in sexual differentiation, sex differences in behavior, sexual behavior, parental behavior, affiliation, aggression, stress, and mood.

**BIOL 185 (E-Z). Advanced Undergraduate Seminar in Biology (2-4)** Seminar, 2-4 hours. Prerequisite(s): upper-division standing with a major in biology or related field. A seminar course offered to provide biology majors and others that can meet the prerequisite of the course, an opportunity for an in-depth consideration of special topics in biology and related areas.

Topics are selected as faculty interest, student interest, and opportunity permit. (Limited enrollment) G. Biology of Development (2); N. Biology of Food (3); P. Psychobiology (2).

**BIOL 190. Special Studies (1-4)** Individual study, 3-12 hours. Prerequisite(s): consent of instructor and departmental chairperson. To be taken as a means of meeting special curricular needs. Grading basis to be selected in consultation with the instructor and departmental chairperson. Course is repeatable.

**BIOL 191. Seminar in Biology (2-4)** Seminar, 2-4 hours. Prerequisite(s): upper-division standing; consent of instructor. A critical study of selected topics in biology. Course is repeatable.

**BIOL 194. Independent Reading (1-4)** Consultation, 1-4 hours. Prerequisite(s): junior or senior standing and consent of instructor and departmental chairperson. Independent study under faculty supervision. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

**BIOL 197. Introduction to Research (1-2)** Consultation, 1-2 hours. Prerequisite(s): sophomore, junior or senior standing and consent of instructor and departmental chairperson. Reading, planning and preliminary laboratory work to develop a research project suitable for BIOL 199, Junior/Senior Research. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BIOL 199. Junior/Senior Research (1-4)** Laboratory, 1-4 hours. Prerequisite(s): junior or senior standing, a minimum GPA of 3.0 and consent of instructor and departmental chairperson. Special problems and research in biology performed under the supervision of members of the faculty of the Department of Biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Graduate Courses

**BIOL 200. Cell Biology (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 113 or BIOL 114 or CBNS 101 or equivalent. An examination of the structure and function of eukaryotic cells and their components with emphasis on the key experiments that provide the foundation for our current knowledge. Covers topics such as cell membranes, intracellular trafficking, cell-to-cell interactions, motility, and the cytoskeleton. Cross-listed with CMDB 200.

**BIOL 201. Molecular Biology (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 107A or equivalent. Covers the structure and inheritance of genetic material, the regulation of gene expression at the cellular and molecular level including molecular mechanisms for regulation of gene transcription, posttranscriptional regulation at the level of messenger RNA stability, processing, editing and translation, methods for gene mapping, and positional cloning. Cross-listed with CMDB 201.

**BIOL 203. Cellular Biophysics (3)** Lecture, 3 hours. Prerequisite(s): BIOL 200/CMDB 200; BIOL 201/CMDB 201; CHEM 109 or equivalent; or consent of instructor. Biophysical principles that determine cellular structure and function including diffusion, electrochemical gradients, transport, macromolecular interactions, and genetic recombination. Illustrative examples are used to highlight the importance of these principles in modern cell biology and physiology.

**BIOL 208. Host-Parasite Relationships (3)** Lecture, 3 hours. Prerequisite(s): BIOL 100/ENTM 100 or BIOL 157 or consent of instructor. Explores the fundamental biochemical and developmental requirements for "successful" host-parasite relationships in insects. Emphasizes wasp and nematode parasites of insects and vector-parasite interactions involved in transmission of parasites in malaria, trypanosoma, and Lyme disease. Cross-listed with ENTM 208.

**BIOL 221. Microbial Genetics (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102. In-depth coverage of the genetics of microbes. Emphasizes the primary data and the foundation of modern techniques using viruses, archae, prokaryotes, and eukaryotes. Includes genome sequences and organization, plasmids and other vectors, and mutation and genetic screens. Also covers transposable elements, recombination, and regulation of gene expression, development, and pathogenesis. Cross-listed with MCBL 221 and PLPA 226. **Borkovich**

**BIOL 250. Special Topics in Biology (1-2)** Seminar, 1-2 hours. Prerequisite(s): graduate standing and consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each staff member. Course content will emphasize recent advances in the special topic area and will vary accordingly. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**BIOL 252. General Colloquium in Biology (1)** Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing. Oral reports by visiting scholars on current biological research. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**BIOL 261. Seminar in Genetics, Genomics, and Bioinformatics (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BPSC 261, ENTM 261, GEN 261, and PLPA 261.

**BIOL 281 (E-Z). Seminar in Cell Development, Structure, and Function (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Lectures, discussions, and demonstrations by students, faculty, and invited scholars on selected subjects concerned with the principles of cell development, structure, and function. E. Cell Biology; F. Molecular Biology; G. Developmental Biology. Segments are repeatable. Cross-listed with CMDB 281 (E-Z).

**BIOL 284. Seminar in Biology (2-4)** Seminar, 2-4 hours. Prerequisite(s): graduate standing; consent of instructor. Consists of lectures, discussions, and demonstrations by students, faculty, and invited scholars on selected topics concerned with the principles of biology. Course is repeatable.

**BIOL 289. Special Topics in Neuroscience (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, CHEM 289, ENTM 289, NRSC 289, and PSYC 289.

**EEOB 211. Ecology: Genes to Ecosystems (4)** Lecture, 4 hours. Prerequisite(s): BIOL 116 or consent of

instructor. Examination of the history, theory, and interrelationships of fundamental ecological principles through readings and discussions of classic and recent literature. Topics include quantitative, population, community, ecosystem, landscape, restoration, conservation, and human or social ecology.

**EEOB 212. Ecological Systems in Space and Time (4)** Lecture, 3 hours; field, 30 hours per quarter. Prerequisite(s): BIOL 117 or BIOL 152/GEO 152 or equivalent or consent of instructor. Focuses on how ecological systems are interpreted and reconciled at the community, landscape, and paleontological scales. Addresses the role of extrinsic factors operating at each of these scales. Also examines the historical development of our understanding of ecological systems at various scales. Cross-listed with ENTM 212 and GEO 212.

**EEOB 213. Behavioral Ecology (4)** Lecture, 4 hours. Prerequisite(s): BIOL 160 or consent of instructor. Examines animal behavior in an evolutionary context. Traces the historical development of the study of behavior, drawing from ethology, comparative psychology, and sociobiology. Topics include evolution of sociality, sexual selection, predator-prey behavior, and parental care.

**EEOB 214. Evolutionary Genetics (4)** Lecture, 4 hours. Prerequisite(s): BIOL 108 or consent of instructor. Traces the historical development of modern ideas in evolutionary genetics. Focuses on the influence of Fisher, Haldane, and Wright on current views of genetic variation in natural populations, by examining recent research in the context of their classic works.

**EEOB 215. Advanced Methods of Data Analysis in Evolution, Ecology, and Behavior (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PSYC 212 or STAT 100B or equivalent. Introduces students to new methods of data analysis in the fields of evolution, ecology, and behavior. Covers theory and practical application using relevant examples. Topics include maximum likelihood, randomization, the jackknife, bootstrapping, Monte Carlo approaches, and meta-analysis.

**EEOB 216. The Theory of Evolution (4)** Lecture, 4 hours. Prerequisite(s): BIOL 105 or consent of instructor. Traces the historical development of modern ideas in evolutionary theory. Focuses on the influence of Darwin and of the various authors of the modern synthesis on current views of macroevolution, by examining recent research in the context of their classic works.

**EEOB 217. Advanced Population and Community Ecology (4)** Lecture, 4 hours. Prerequisite(s): BIOL 117 or consent of instructor. Traces the development of the major concepts in ecology. Focuses on the influence of pioneers in the field, historical roots of key concepts, and key controversies. Evaluates current research with reference to these historical origins. **Redak, Rotenberry**

**EEOB 219. Theory of Systematics (4)** Lecture, 4 hours. Prerequisite(s): BIOL 112/BPSC 112/ENTM 112 or equivalent or consent of instructor. Examines topics developed around a series of classical and recent papers on the principles, philosophy, and methodology of modern systematics and phylogenetic methods. Cross-listed with ENTM 219 and GEO 219.

**EEOB 220. Evolutionary Physiology (4) S, Even Years** Lecture, 4 hours. Prerequisite(s): an upper-division course in evolution and animal physiology or behavior, an upper-division course in statistics that covers analysis of covariance; or consent of instructor. Covers evolutionary approaches to the study of animal physiology. Includes organismal and organ-system physiology; biomechanics and locomotor mechanisms; cell

physiology; the development of physiological systems; and behavioral neuroscience. **Altshuler, Garland, Jr.**

**EEOB 230. Analysis of Ecological Communities (5)** Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): PSYC 212 or STAT 231B or equivalent; consent of instructor. Covers principles of multivariate analysis and its application to the interpretation of ecological community data. Topics include multiple and partial correlation and regression, canonical correlation, detrended and canonical correspondence analysis, multidimensional scaling, similarity indices and cluster analysis, and discriminant analysis.

**EEOB 265. Advances in Population and Evolutionary Biology (1 or 2)** Seminar, 1 hour; outside research, 0-3 hours. Prerequisite(s): graduate standing or consent of instructor. Presentations by visiting scholars, faculty, and students on current research topics in population and evolutionary biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EEOB 282. Seminar in Genetics and Evolution (2-4)** Seminar, 2-4 hours. Prerequisite(s): graduate standing; consent of instructor. Presentations by students, faculty, and invited scholars on selected topics concerned with the principles of genetics and evolution. Course is repeatable.

**EEOB 283. Seminar in Organismal Physiology and Physiological Ecology (2-4)** Seminar, 2-4 hours. Prerequisite(s): graduate standing; consent of instructor. Presentations by students, faculty, and invited scholars on selected topics concerned with the principles of organismal physiology and physiological ecology. Course is repeatable.

**EEOB 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual studies on specially selected topics in evolution, ecology, and organismal biology under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EEOB 291. Individual Study in Coordinated Areas (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing. Provides a program of study designed to advise and assist candidates who are preparing for examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EEOB 292. Concurrent Analytical Studies in Evolution, Ecology, and Organismal Biology (2-4)** Outside research, 6-12 hours. Prerequisite(s): consent of instructor. Elected concurrently with an appropriate undergraduate course but on an individual basis. Devoted to one or more graduate papers based on research or criticism related to the course. Faculty guidance and evaluation provided throughout the quarter. Course is repeatable.

**EEOB 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Directed research in evolution, ecology, and organismal biology. Experimental studies on specially selected topics under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EEOB 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**BIOL 301. Teaching of Biology at the College Level (1)** Seminar, 1 hour. Prerequisite(s): graduate standing. A

program of weekly meetings and individual formative evaluations required of new Biology Teaching Assistants. Covers instructional methods and classroom/section activities most suitable for teaching Biology. Conducted by the TA Development Program. Graded Satisfactory (S) or No Credit (NC).

**BIOL 303. Philosophy and Pedagogy of Teaching Undergraduate Life Sciences (3)** Lecture, 1 hour; laboratory, 3 hours; workshop, 1 hour. Prerequisite(s): graduate standing in life sciences. Explores the opportunities and challenges associated with developing an undergraduate course in the life sciences. Emphasizes determining how students learn, as well as exploring contemporary instruction methods that foster student engagement in the classroom. Graded Satisfactory (S) or No Credit (NC). Cross-listed with ENTM 303. **Cardullo, Paine, Regan**

**EEOB 400. Introduction to Graduate Study in Biology (2)** Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Introduces opportunities and requirements for successful graduate study. Emphasis is placed on effective strategies for developing and implementing a program of professional development and graduate research. Graded Satisfactory (S) or No Credit (NC).

## Biomedical Sciences

**Subject abbreviation: BMSC**  
**Division of Biomedical Sciences**

G. Richard Olds, M.D., Vice Chancellor for Health Affairs and Dean of the School of Medicine

Craig V. Byus, Ph.D., Senior Associate Dean, Academic Affairs and Research, UCR School of Medicine and Divisional Dean of the UCR/UCLA Thomas Haider Program in Biomedical Sciences

Neal L. Schiller, Ph.D., Senior Associate Dean, Student Affairs, UCR School of Medicine

Dan S. Straus, Ph.D., Chair of the Faculty Stewart W. Shankel, M.D., Director of Clinical Instruction

Lawrence K. Loo, M.D., Associate Director of Clinical Instruction

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David A. Johnson, Ph.D. *Pharmacology*  
David Lo, M.D., Ph.D. *Genetics (Distinguished Professor)*

G. Richard Olds, M.D., FACP

Paul M. Quinton, Ph.D. *Physiology*

Neal L. Schiller, Ph.D. *Microbiology/Immunology*

John Y.-J. Shyy, Ph.D. *Pharmacology/Physiology*

Daniel S. Straus, Ph.D. *Human Genetics* (Biomedical Sciences)

Ameae M. Walker, Ph.D. *Microanatomy*

### Professors Emeriti

Mary Ann Baker, Ph.D. *Neurosciences*

Richard A. Luben, Ph.D. *Endocrinology* (Biomedical Sciences/Biochemistry)

Anthony W. Norman, Ph.D. *Endocrinology* (Biomedical Sciences/Biochemistry)

Michael B. Stemberman, M.D. *Biomedical Sciences*

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Kathryn DeFea, Ph.D. *Cell Biology/Biochemistry*  
Iryna M. Ethell, Ph.D. *Biology/Biochemistry*  
Christian Y. Lytle, Ph.D. *Physiology*

#### Assistant Professor

Emma Wilson, Ph.D. *Parasite Immunologist*  
\*\*

#### Assistant Research Scientist

Devin Binder, M.D.

#### Lecturer

James Colgan, Ph.D.

#### Clinical Professors

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Ann F. Bolger, M.D.  
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C. Paul Sinkhorn, M.D.  
Catherine Steel, Ph.D.  
Paula W. Stoessel, Ph.D.  
Constance M. Vadheim, Ph.D.

#### Associate Clinical Professors

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Suvesh Chandiook, M.D.  
Walter P. F. Combs, M.D.  
Alan C. Compton, M.D.  
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Javier I. Machuca, M.D.  
D. Steven Meyering, M.D.  
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Renu Mittal, M.D.  
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Baldev S. Rai, M.D.  
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Ravi Thiruvengadam, M.D.  
Samuel G. Wiltchik, M.D.  
Joanne T. Witkowski, M.D.

#### Assistant Clinical Professors

Raja Bhupathy, M.D.  
Antonius Brandon, Ph.D.  
Darcy Bryan, Ph.D.  
Adam Chen, M.D.  
Andrew P. Corr, M.D.  
Tien N. Dinh, M.D.

Leita J. Harris, M.D.  
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Charles Pai, D.O.  
Lien Tran Pham, M.D.  
Michael T. Saito, M.D.  
Karen White, Ph.D.  
Steven Wilson, M.D.  
Babak Zamiri, M.D.

## UCR/UCLA Thomas Haider Program in Biomedical Sciences

The mission of the prestigious UCR/UCLA Thomas Haider Program in Biomedical Sciences is to train physicians for distinguished medical careers in service to the people of California, with an emphasis on the needs of the underserved, inland, and rural populations.

UCR provides a unique path of entrance to one of the country's leading medical schools. Undergraduate students at UCR have exclusive access to 24 seats in medical school each year through the university's joint program with the David Geffen School of Medicine at UCLA. UCR students admitted to the program complete years 1 and 2 of their medical education at UCR. They follow a state-of-the-art disease-based integrated curriculum taught by basic-science research faculty who work closely with a special cadre of highly qualified, community-based, physician faculty. This curriculum focuses on developing the process of life-long learning, employs problem-based learning, and requires extensive computer use. Years 3 and 4 of medical school are completed at UCLA, after which students receive their M.D. degrees from UCLA.

Only undergraduates who entered UCR as freshmen or as transfer students may apply to the UCR/UCLA Program. Students must be enrolled at UCR for at least two years (six continuous full-time quarters) in the pursuit of a bachelor's degree before entering the program. Only under truly exceptional circumstances will the program matriculate a student without a UCR baccalaureate degree.

Applicants apply through the American Medical College Application Service, at [www.amcas.org](http://www.amcas.org), following its guidelines and deadlines. Students may submit their applications at any time during the application period, as early as June (14 months before medical school classes begin in August at UCR) or as late as November 1 (9 months before classes begin). Applications without recent MCAT scores are considered incomplete. Review the application guidelines at [www.biomed.ucr.edu](http://www.biomed.ucr.edu) and the application process at [www.amcas.org](http://www.amcas.org).

Unique aspects of the program include the following:

- The 24 annual seats in the program are open to UCR undergraduate students and alumni only.
- Students from any major may apply for one of the 24 seats as long as they will have completed the prerequisite course work and

fulfilled other application requirements before entering the program.

- Students accepted into the UCR/UCLA Program complete their first two years of medical school on the UCR campus and then move to UCLA to complete their medical education and graduate with an M.D. from UCLA.

**Prerequisite Courses** Students preparing to apply to the UCR/UCLA Program should excel in their undergraduate academic program and complete specific course work before admission to the UCR/UCLA Program. Students who plan to transfer to UCR from another college or university for their undergraduate studies and then apply to the UCR/UCLA Program should complete, where possible, courses that have been designated as being equivalent to UCR courses. Transfer students from community colleges are encouraged to view the UCR/UCLA Program as an attractive and viable avenue to medical school.

The UCR/UCLA Program prerequisite course curriculum is identical to the admissions requirements of the David Geffen School of Medicine at UCLA. Shown as UCR course work, it is as follows:

English — one year of college English to include the study of English composition (ENGL 001A, ENGL 001B, ENGL 001C or equivalent)

Physics — one year of college physics with laboratory (PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC or equivalent)

Chemistry — two years of college chemistry to include the study of inorganic chemistry and organic chemistry with laboratory (CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, and CHEM 112A, CHEM 112B, CHEM 112C or equivalent)

Biology — one year of general biology with laboratory (BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C or equivalent)

Mathematics — one year of college mathematics to include introductory calculus and statistics (MATH 009A, MATH 009B, STAT 100A or equivalent)

A one-quarter course in biochemistry to cover structure, function, and metabolism of biological molecules (BCH 100 or BCH 110A, BCH 110B or equivalent), while not required for admission, is highly recommended. Courses in Spanish language and the humanities are also highly recommended.

AP results will not be accepted as substitutes for the required courses.

**Related Literature and References** UCR currently has articulation agreements with most of the California community colleges. These agreements list specific community college courses that have been designated as comparable to UCR courses. See the statewide articulation

Web site, at [www.assist.org](http://www.assist.org), or California community college Web sites.

**Academic Advising** UCR undergraduates receive academic advising from professional staff and faculty of the department or program of their chosen major.

**Admission** Students from any UCR major are eligible to apply for one of the 24 seats in the medical school each year. The admission requirements for the UCR/UCLA Program are identical to those for UCLA's Geffen School of Medicine, but UCR students have a distinct advantage when applying to the UCR/UCLA Program. They compete only with other UCR students for those 24 seats in the program and the opportunity to earn an M.D. degree from UCLA's Geffen School of Medicine.

**Admission considerations** A strong candidate for admission to the UCR/UCLA Program has:

- Completed the UCR/UCLA Program prerequisite course curriculum
- An excellent undergraduate academic record
- An excellent score on the Medical College Admission Test (MCAT)

The strong candidate also shows a commitment to a career in medicine as demonstrated by volunteerism in medicine, clinical experience, or research.

A solid record of community service is highly desired. It is important that applicants have made a difference to those around them. Examples of community service pursuits include volunteer work, leadership in campus organizations, mentor service for a peer or youth group, and commitment to and participation in religious or service organizations.

**Letters of Reference** Applicants must submit letters from individuals such as professors and those who can speak about the applicant's educational talents, character, work ethic, motivation, special traits, and positive influence on others.

**Admission Interview** Qualified applicants will be invited to interview and have the opportunity to talk about themselves, their special qualities, and demonstrate their ability to interact with others.

## A Four-Year Medical Program

**Years 1 and 2** Students admitted to the UCR/UCLA Program are jointly enrolled at UCR and UCLA's Geffen School of Medicine and take their first two years of medical school at UCR. Unlike other medical schools where students are taught in classes of 100 or more, the classes in the UCR/UCLA Program are small and comprised of 28 medical students during each of the first two years (24 UCR/UCLA Haider Program students and 4 UCLA/UCR Geffen School of Medicine PRIME students, see [www.medsch.ucla.edu/uclaprime](http://www.medsch.ucla.edu/uclaprime) for more information). This allows students to get to know their professors and receive the individual help and guidance they need to succeed. Classes in years 1 and 2 are taught

by the UCR/UCLA Program faculty who are at the forefront of teaching and research and by community-based physician faculty with real-world understanding of medicine.

**Years 3 and 4** Students move to UCLA's Geffen School of Medicine for the third and fourth years, where they participate in required and elective clinical rotations. UCLA Medical Center and the network of affiliated hospitals provide diverse settings for students to receive exemplary clinical experiences and utilize cutting-edge technology. In the fourth year, most graduating students are matched with one of their three top choices for a residency program.

Students also have the opportunity to spend up to 12 weeks away at other universities to explore a particular area of interest. Externships in foreign countries exist as well.

### For more information

UCR/UCLA Thomas Haider Program  
in Biomedical Sciences  
Office of Student Affairs  
1626 Statistics/Computer Building  
University of California, Riverside  
Riverside, CA 92521  
(951) 827-4333 or 4334  
[dayna.moore@ucr.edu](mailto:dayna.moore@ucr.edu) or  
[margie.moreno@ucr.edu](mailto:margie.moreno@ucr.edu)

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

## B.S. Degree Requirements

The following major requirements apply only to students who, in truly exceptional cases, matriculate into the UCR/UCLA Haider Program without a UCR baccalaureate degree. These students are eligible to receive a B.S. degree in Biomedical Sciences upon satisfactory completion of the first year of the curriculum leading to the M.D. degree granted by the David Geffen School of Medicine at UCLA.

## Major Requirements

1. Biological Sciences Core Curriculum (65-68 units)
  - a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C or equivalent
  - b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, CHEM 112A, CHEM 112B, CHEM 112C or equivalent
  - c) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC or equivalent
  - d) MATH 008B or MATH 009A, MATH 009B or equivalent
  - e) STAT 100A or equivalent
  - f) BCH 100 or BCH 110A or equivalent
2. Courses taken during the first year of med-

ical school (59 units)

BMSC 231, BMSC 231M, BMSC 232, BMSC 232M, BMSC 233, BMSC 233M, BMSC 234, BMSC 234M, BMSC 235, BMSC 235M

## Lower-Division Courses

### BMSC 091. Freshman Advising Seminar for Medical Scholars Program Students (1)

Seminar, 1 hour. Prerequisite(s): freshman standing in the Medical Scholars Program. Introduction to UCR for students in the Medical Scholars Program. Focuses on learning the necessary survival skills to succeed in college and prepare for a career in the allied health sciences. Graded Satisfactory (S) or No Credit (NC).

### BMSC 092. First-Year Seminar for Medical Scholars Program Students: Topics in Health Careers (1)

Seminar, 1 hour. Prerequisite(s): freshman standing in the Medical Scholars Program or consent of instructor. A discussion of health careers in biomedical sciences and allied health sciences for students in the Medical Scholars Program. Graded Satisfactory (S) or No Credit (NC).

### BMSC 093. Seminar for Medical Scholars Program Students (1)

Seminar, 1 hour. Prerequisite(s): lower-division standing in the Medical Scholars Program or consent of instructor. A discussion of special topics in biomedical sciences and allied health sciences as they pertain to students in the Medical Scholars Program. Graded Satisfactory (S) or No Credit (NC).  
**Schiller**

### BMSC 094. Independent Reading (1-2)

Consultation, 1-2 hours. Prerequisite(s): consent of instructor. Independent study under faculty supervision. Possible topics include modern approaches to the pathophysiology of disease, delivery of medical care to the community, or current medical education. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

### BMSC 097. Research Tutorial in Biomedical

**Sciences (1-2)** Laboratory, 3-6 hours. Prerequisite(s): grade point of 3.0 and consent of instructor. Laboratory tutorial in research related to biomedical sciences. To provide laboratory experience in the areas of physiology, microbiology, molecular biology, pharmacology, cell biology, immunology, biochemistry for exceptional lower-division students. A written report is required at the end of each quarter. Graded Satisfactory (S) or No Credit (NC). May be repeated for up to 6 units.

## Upper-Division Courses

### BMSC 191. Seminar in Biomedical Sciences (2)

Seminar, 20 hours per quarter. Prerequisite(s): upper-division standing in the Medical Scholars Program or consent of instructor. Special topics in biomedical sciences, healthcare delivery, cultural competency, biomedical research, and related areas. Course is repeatable to a maximum of 6 units.

### BMSC 194. Independent Reading (1-2)

Discussion, 1 hour; outside research, 2-3 hours. Prerequisite(s): upper-division standing and consent of instructor and Divisional Dean. Independent study involving library projects on topics related to Biomedical Sciences. Independent study will be conducted under faculty supervision. A written report to be graded Satisfactory (S) or No Credit (NC) will be requested. Course is repeatable to a maximum of 4 units.

**BMSC 197L. Research for Undergraduates (1-3)**

Laboratory, 3-9 hours. Prerequisite(s): upper-division standing (completion of 90 quarter units) and consent of instructor. An introduction to the methods of research in biomedical sciences. The student will conduct investigation in an area of biomedical sciences under the supervision of a Division of Biomedical Sciences faculty member and submit a written report on his/her work. Course is repeatable.

## Graduate Courses

**BMSC 202. Molecular Basis of Disease (3) S** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Discussion of the molecular basis of disease with special emphasis on new developments and the broad application of approaches and techniques. Course is repeatable with consent of the student's advisory committee; may be applied only once toward core requirements.

**BMSC 222 (E-Z). Special Topics in Biomedical Sciences (2)** Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. For BMSC 222V: BIOL 128/CBNS 128 or consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each faculty member. Course emphasizes recent advances in the special topic area and varies accordingly. E. Basic Epitheliology. **Lytle, Quinton**. G. Regulation of Gene Expression. **Straus**. J. Microbial Pathogenesis and Host-Pathogen Interactions. **Schiller**. L. Current Topics in Cell Biology. **Walker**. M. Hormone Action. **Byus, Luben**. N. Mechanisms of Steroid Hormones. **Norman**. O. Steroid Metabolism. **Henry**. P. Molecular Pharmacology. **Johnson**. Q. Mechanisms of Carcinogenesis. **Byus**. U. Transport Physiology. **Lytle**. V. Advanced Immunology. X. Mutagenesis and Genetic Instability. **Grosovsky**. Y. Cancer Genetics. Segments are repeatable. **Byus in charge**

**BMSC 223 (E-Z). Themes in Human Biology and Disease (2-4)** For hours and prerequisites, see segment descriptions. Graduate students write a paper on current basic research relevant to the course theme.

**BMSC 223E. Inflammation, Autoimmunity, and Pathogen Defense (3)** Lecture, 23 hours per quarter; discussion, 8 hours per quarter; laboratory, 8 hours per quarter. Prerequisite(s): consent of course coordinator. Integrative view of the human immune system and inflammation in health and disease. Credit is awarded for only one of BMSC 223E, BMSC 229, or BMSC 231. **Carson**

**BMSC 223F. Cardiovascular Physiology (4)** Lecture, 30.5 hours per quarter; discussion, 11.5 hours per quarter; laboratory, 5 hours per quarter. Prerequisite(s): consent of course coordinator. Integrative view of the human cardiovascular system in health and disease. Credit is awarded for only one of BMSC 223F or BMSC 232. **Lytle**

**BMSC 223G. Renal Physiology (3)** Lecture, 22 hours per quarter; discussion, 8 hours per quarter; laboratory, 2 hours per quarter. Prerequisite(s): consent of course coordinator. Integrative view of human kidney function and dysfunction. Credit is awarded for only one of BMSC 223G or BMSC 232. **Quinton**

**BMSC 223-I. Respiratory Physiology (3)** Lecture, 25 hours per quarter; discussion, 8 hours per quarter; laboratory, 6.5 hours per quarter. Prerequisite(s): consent of course coordinator. Integrative view of the human respiratory system in health and disease. Credit is awarded for only one of BMSC 223I or BMSC 232. **Quinton**

**BMSC 223J. Gastrointestinal Physiology (3)** Lecture, 33 hours per quarter; laboratory, 6 hours per quarter. Prerequisite(s): consent of course coordinator. Integrative view of the human gastrointestinal system in health and disease. Credit is awarded for only one of BMSC 223J or BMSC 233. **Lytle**

**BMSC 229. Foundations in Translational Research (8) Summer** Lecture, 67 hours per quarter; discussion, 7 hours per quarter; laboratory, 18 hours per quarter. Prerequisite(s): first-year standing in the Biomedical Sciences graduate program or consent of graduate advisor. Covers basic principles of disease processes, genetics, and molecular, cellular, and developmental biology. Case-driven instruction accomplished through lectures and discovery in small group discussions and laboratories. Offered in summer only. Credit is awarded for only one of BMSC 223E, BMSC 229, or BMSC 231. **DeFea, Straus**

**BMSC 231. Foundations of Medicine I (7.5)** Lecture, 65.5 hours per quarter; discussion, 6 hours per quarter; laboratory, 20.5 hours per quarter. Prerequisite(s): first-year standing in medical school or consent of instructor. Covers basic principles of disease processes, genetics, and molecular, cellular, and developmental biology. Instruction is driven by cases and accomplished through lectures and discovery in small group discussions, laboratories, and conferences. Students using this course to fulfill requirements for the B.S. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of BMSC 223E, BMSC 229, or BMSC 231. **DeFea, Straus**

**BMSC 231M. Foundations of Medicine I: Clinical Aspects (3)** Lecture, 2 hours per quarter; discussion, 24 hours per quarter; clinic, 15 hours per quarter. Prerequisite(s): first-year standing in medical school or consent of course coordinator; concurrent enrollment in BMSC 231. Covers aspects of anatomy, doctoring, and patient examination. Includes problem-based learning that supports the material covered in BMSC 231. Students using this course to fulfill requirements for the B.S. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **DeFea, Straus**

**BMSC 232. Cardiovascular, Renal, and Respiratory Sciences I (12)** Discussion, 9 hours per quarter; laboratory, 19 hours per quarter; lecture, 107 hours per quarter. Prerequisite(s): first-year standing in medical school or the graduate program in Biomedical Sciences or consent of instructor; BMSC 229 or BMSC 231. Covers physiology, pathophysiology, physical diagnosis, and imaging in the cardiovascular, renal, and respiratory sciences. Instruction is driven by cases and accomplished through lectures and discovery in small group discussions, laboratories, and conferences. Students using this course to fulfill requirements for the B.S. or Ph.D. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of BMSC 223F or BMSC 232 and for only one of BMSC 223G or BMSC 232 and for only one of BMSC 223I or BMSC 232. **Lytle, Quinton**

**BMSC 232M. Cardiovascular, Renal, and Respiratory Sciences I: Clinical Aspects (5.5)** Lecture, 6 hours per quarter; discussion, 36 hours per quarter; laboratory, 9 hours per quarter; clinic, 36 hours per quarter. Prerequisite(s): BMSC 231; BMSC 231M; concurrent enrollment in BMSC 232. Covers aspects of anatomy, doctoring, and patient examination. Includes problem-based learning that supports the material covered in BMSC 232. Students using this course to fulfill requirements for the B.S. degree in Biomedical

Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **Lytle, Quinton**

**BMSC 233. Gastrointestinal, Endocrine, and Reproductive Health I (10)** Lecture, 85 hours per quarter; discussion, 8 hours per quarter; laboratory, 21 hours per quarter; . Prerequisite(s): first-year standing in medical school or the graduate program in Biomedical Sciences or consent of instructor; BMSC 232. Covers biochemistry, pathophysiology, physical diagnosis, and imaging associated with gastrointestinal, endocrine, and reproductive health. Instruction is driven by cases and accomplished through lectures and discovery in small group discussions, laboratories, and conferences. Students using this course to fulfill requirements for the B.S. or Ph.D. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of BMSC 223J or BMSC 233. **Luben, Shyy**

**BMSC 233M. Gastrointestinal, Endocrine, and Reproductive Health I: Clinical Aspects (4)** Lecture, 8 hours per quarter; discussion, 18 hours per quarter; laboratory, 12 hours per quarter; clinic, 34 hours per quarter. Prerequisite(s): BMSC 232; BMSC 232M; concurrent enrollment in BMSC 233. . Covers aspects of anatomy, doctoring, and patient examination. Includes problem-based learning that supports the material covered in BMSC 233. Students using this course to fulfill requirements for the B.S. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **Luben, Shyy**

**BMSC 234. Musculoskeletal Medicine (4)** Lecture, 36 hours per quarter; discussion, 2 hours per quarter; laboratory, 7 hours per quarter. Prerequisite(s): first-year standing in medical school or the graduate program in Biomedical Sciences or consent of instructor; BMSC 233. Covers the musculoskeletal system, biology and pathology of the peripheral nervous system, and physical diagnosis. Utilizes lectures and case studies to accomplish course objectives. Promotes discovery of learning by small group discussions, laboratories, and conferences. Students using this course to fulfill requirements for the B.S. or Ph.D. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **Baker, Colgan**

**BMSC 234M. Musculoskeletal Medicine: Clinical Aspects (4)** Lecture, 14 hours per quarter; discussion, 10 hours per quarter; laboratory, 30 hours per quarter; clinic, 18 hours per quarter. Prerequisite(s): BMSC 233; BMSC 233M; concurrent enrollment in BMSC 234. Covers aspects of anatomy, doctoring, and patient examination. Includes problem-based learning that supports the material covered in BMSC 234. Students using this course to fulfill requirements for the B.S. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **Johnson**

**BMSC 235. Clinical Neurosciences I (5)** Lecture, 42 hours per quarter; discussion, 8 hours per quarter; laboratory, 6 hours per quarter. Prerequisite(s): BMSC 234. Covers neurobiology and provides an introduction to neurology and psychiatry, as well as physical diagnosis and imaging of the nervous system. Utilizes lectures and case studies to accomplish course objectives. Promotes discovery of learning by small group discussions, laboratories, and conferences. Students using this course to fulfill requirements for the B.S. or Ph.D. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **D. Ethell, I. Ethell**

**BMSC 235M. Clinical Neurosciences I: Clinical Aspects (4)** Lecture, 10 hours per quarter; discussion, 16 hours per quarter; laboratory, 27 hours per quarter; clinic, 15 hours per quarter. Prerequisite(s): BMSC 234; BMSC 234M; concurrent enrollment in BMSC 235. Covers aspects of anatomy, doctoring, and patient examination. Includes problem-based learning that supports the material covered in BMSC 235. Students using this course to fulfill requirements for the B.S. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **D. Ethell, I. Ethell**

**BMSC 236. Foundations of Medicine II (10)** Lecture, 93 hours per quarter; discussion, 8 hours per quarter; laboratory, 10 hours per quarter. Prerequisite(s): second-year standing in medical school or the graduate program in Biomedical Sciences or consent of instructor; BMSC 235. Covers the pathophysiology, pharmacology, physical diagnosis and treatment of infectious diseases, clinical hematology and oncology, and epidemiology and clinical reasoning skills. Instruction involves weekly cases and is presented through lectures and discovery in small group discussions, laboratories, and conferences. Students using this course to fulfill requirements for the Ph.D. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **Schiller**

**BMSC 236M. Foundations of Medicine II: Clinical Aspects (4)** Discussion, 28 hours per quarter; clinic, 42 hours per quarter. Prerequisite(s): BMSC 235; BMSC 235M; concurrent enrollment in BMSC 236. Covers aspects of doctoring and patient examination. Includes problem-based learning that supports the material covered in BMSC 236. Graded Satisfactory (S) or No Credit (NC). **Schiller**

**BMSC 237. Gastrointestinal, Endocrine, and Reproductive Health II (13)** Lecture, 80 hours per quarter; clinic, 42 hours per quarter; discussion, 34 hours per quarter; laboratory, 18 hours per quarter. Prerequisite(s): second-year standing in medical school; BMSC 236. Advanced clinical perspective of anatomy, biochemistry, pathophysiology, physical diagnosis, and imaging associated with gastrointestinal, endocrine, and reproductive health. Instruction involves weekly cases and is presented through lectures (usually two hours/day) and discovery in small group discussions, laboratories, clinical skills development, and conferences. Graded Satisfactory (S) or No Credit (NC). **Carson, Walker**

**BMSC 238. Clinical Neurosciences II (10)** Lecture, 74 hours per quarter; discussion, 22 hours per quarter; laboratory, 6 hours per quarter; clinic, 24 hours per quarter. Prerequisite(s): BMSC 237. Covers advanced clinical perspective of neurology, neuropathology, psychiatry, and neuropharmacology that is coordinated with physical and psychological clinical skills development. Involves weekly cases and is presented through lectures, laboratories, small group discussions, conferences, and clinic visits. Graded Satisfactory (S) or No Credit (NC). **Johnson**

**BMSC 239. Cardiovascular, Renal, and Respiratory Sciences II (12)** Lecture, 62 hours per quarter; clinic, 33 hours per quarter; discussion, 44 hours per quarter; laboratory, 36 hours per quarter. Prerequisite(s): second-year standing in medical school; BMSC 238. Advanced clinical perspective of anatomy, physiology, pathophysiology, physical diagnosis, and imaging in the cardiovascular, renal, and respiratory sciences. Instruction involves weekly cases and is presented through lectures and discovery in small group discussions, laboratories, clinical skills development, and conferences. Graded Satisfactory (S) or No Credit (NC). **Carson, Walker**

**BMSC 240. Integrative Human Biology and Disease (3)** Discussion, 30 hours per quarter. Prerequisite(s): second-year standing in medical school; BMSC 239. Reviews concepts of human biology and disease covered in BMSC 231, BMSC 231M, BMSC 232, BMSC 232M, BMSC 233, BMSC 233M, BMSC 234, BMSC 234M, BMSC 235, BMSC 235M, BMSC 236, BMSC 236M, BMSC 237, BMSC 238, and BMSC 239. Graded Satisfactory (S) or No Credit (NC). **Shankel**

**BMSC 251. Colloquium in Biomedical Sciences (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Specialized discussions by staff and students of current research topics in biomedical sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BMSC 252. General Seminar in Biomedical Sciences (1)** Seminar, 1 hour. Prerequisite(s): graduate standing. Oral presentations by staff and visiting scholars on current research topics in the field of biomedical sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BMSC 254. Graduate Seminar in Biomedical Sciences (1)** Seminar, 1 hour. Prerequisite(s): graduate standing. Oral reports by graduate students on current research topics in biomedical sciences. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**BMSC 260A. Topics in Translational Biomedical Research (2) F** Lecture, 2 hours per quarter; discussion, 18 hours per quarter. Prerequisite(s): consent of instructor or graduate advisor; concurrent enrollment in BMSC 232. A survey of the mechanisms of common human diseases at the molecular, cellular and organ system levels and the multidisciplinary approaches used for their investigation. Instructional components include lectures, discovery in problem-based learning sessions, and independent study. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. **Byus, Lytle**

**BMSC 260B. Topics in Translational Biomedical Research (2)** Lecture, 2 hours per quarter; discussion, 18 hours per quarter. Prerequisite(s): consent of instructor or graduate advisor; concurrent enrollment in BMSC 233. A survey of the mechanisms of common human diseases at the molecular, cellular and organ system levels and the multidisciplinary approaches used for their investigation. Instructional components include lectures, discovery in problem-based learning sessions, and independent study. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. **Shyy, Wilson**

**BMSC 260C. Topics in Translational Biomedical Research (2)** Lecture, 2 hours per quarter; discussion, 18 hours per quarter. Prerequisite(s): consent of instructor or graduate advisor; concurrent enrollment in BMSC 234 and BMSC 235. A survey of the mechanisms of common human diseases at the molecular, cellular and organ system levels and the multidisciplinary approaches used for their investigation. Instructional components include lectures, discovery in problem-based learning sessions, and independent study. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. **Carson, Lo**

**BMSC 261. Methods in Biomedical Research (1)** Tutorial, 3 hours. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Experimental studies on a specific laboratory technique involved in the study of human disease. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units. **Carson**

**BMSC 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Experimental or literature studies on specifically selected topics under direction of a staff member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BMSC 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Directed research in biomedical sciences performed prior to advancement to candidacy in preparation for dissertation projects. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BMSC 299. Research for Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Original research in the area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**BMSC 302. Directed Teaching (2)** Practicum, 6 hours. Prerequisite(s): graduate standing in Biomedical Sciences. Supervised teaching in medical school courses. Required for all Biomedical Sciences graduate students. Fulfills the teaching portion of the teaching requirement for the Ph.D.; four units are required for the Ph.D. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

# Biomedical Sciences Graduate Program

**Subject abbreviation: BMSC**  
**Division of Biomedical Sciences**

Craig V. Byus, Ph.D.,  
Dean and Program Director  
Program Office, 1001 Batchelor Hall North  
(800) 735-0717 or (951) 827-5621  
[biomed.ucr.edu/graduate](http://biomed.ucr.edu/graduate)

### Professors

Peter Atkinson, Ph.D. (Entomology)  
Bahman Anvari, Ph.D. (Bioengineering)  
Craig V. Byus, Ph.D. (Biomedical Sciences/  
Biochemistry)  
David A. Eastmond, Ph.D. (Cell Biology  
and Neuroscience)  
Ted Garland, Ph.D. (Biology)  
David A. Johnson, Ph.D. (Biomedical Sciences)  
Cindy Larive, Ph.D. (Chemistry)  
Xuan Liu, M.D., Ph.D. (Biochemistry)  
David Lo, M.D., Ph.D. (Biomedical Sciences)  
Manuela M. Martins-Green, Ph.D. (Cell Biology  
and Neuroscience)  
Dimitrios Morikis, Ph.D. (Bioengineering)  
Michael C. Pirrung, Ph.D. (Chemistry)  
Edward G. Platzer, Ph.D. (Biology/Nematology)  
Paul M. Quinton, Ph.D. (Biomedical Sciences)  
Victor Rodgers, Ph.D. (Bioengineering)  
Neal L. Schiller, Ph.D. (Biomedical Sciences)  
Jerome Schultz, Ph.D. (Bioengineering)  
John Y.-J. Shyy, Ph.D. (Biomedical Sciences)  
B. Glenn Stanley, Ph.D. (Cell Biology and Neuro-  
science/Psychology)  
Daniel S. Straus, Ph.D. (Biomedical Sciences/  
Biology)  
Ameae M. Walker, Ph.D. (Biomedical Sciences)

**Professors Emeriti**

Helen L. Henry, Ph.D. (Biochemistry)  
 Richard A. Luben, Ph.D. (Biomedical Sciences/  
 Biochemistry)  
 Anthony W. Norman, Ph.D. (Biomedical Sciences/  
 Biochemistry)  
 Michael B. Stemerman, M.D. (Biomedical Sciences)

**Associate Professors**

Monica J. Carson, Ph.D. (Biomedical Sciences)  
 Margarita C. Currás-Collazo, Ph.D. (Cell Biology  
 and Neuroscience)  
 Scott N. Currie, Ph.D. (Cell Biology  
 and Neuroscience)  
 Kathryn DeFea, Ph.D. (Biomedical Sciences)  
 Iryna M. Ethell, Ph.D. (Biomedical Sciences)  
 Christian Y. Lytle, Ph.D. (Biomedical Sciences)  
 Morris Maduro, Ph.D. (Biology)

**Assistant Professors**

Douglas Altshuler, Ph.D. (Biology)  
 Anupama Dahanukar Ph.D. (Entomology)  
 Kelly Huffman, Ph.D. (Psychology)  
 Edward Korzus, Ph.D. (Psychology)  
 Karine Le Roch, Ph.D. (Cell Biology and  
 Neuroscience)  
 Jiayu Liao, Ph.D. (Bioengineering)  
 Ernest Martinez, Ph.D. (Biochemistry)  
 Joao Pedra, Ph.D., (Entomology)  
 Anandasankar Ray, Ph.D. (Entomology)  
 Khaleel Razak, Ph.D. (Psychology)  
 Wendy Saltzman, Ph.D. (Biology)  
 Noboru Sato, Ph.D. (Cell Biology and  
 Neuroscience)  
 Emma Wilson, Ph.D. (Biomedical Sciences)  
 Laura Zanella, Ph.D. (Biochemistry)

## Graduate Program

The multidisciplinary interdepartmental graduate program in Biomedical Sciences offers graduate instruction leading to a Ph.D. degree or a combined M.D.–Ph.D. degree.

The aim of the graduate program is to provide students with training that crosses traditional boundaries between scientific disciplines and allows them to address modern biomedical research questions. The objective is to train scientists who have a broad knowledge of basic medical sciences, a high degree of expertise in an area of specialization, and effective teaching skills for a medical school or university environment.

The need for scientists who understand the interrelationships of various areas of medical science is readily apparent. For example, it is clearly advantageous for a scientist studying diabetes to understand the disease in depth. This requires a fundamental understanding of endocrinology (hormone secretion and action), cell biology (cell types that produce insulin and upon which insulin acts), biochemistry (insulin-receptor interactions, biochemical pathways regulated by insulin), genetics (hereditary factors in the development of diabetes), immunology (autoimmune mechanisms in diabetes), and anatomy (microvascular pathology). There is a growing need for scientists who can communicate among disciplines so that very effective research collaborations can be developed.

**Cell Biology/Physiology** research areas include function of transcription factors in development, disease, and in the promotion of regen-

eration; fluid and electrolyte pathophysiology in cystic fibrosis; molecular genetics of human cell response to environmental carcinogens; tumor suppressor genes in malignant melanoma; molecular basis of Down syndrome; factors controlling lymphocyte differentiation; mechanisms of action of cytotoxic lymphokines; physiological aspects of host–parasite interaction; and host defense mechanisms in infectious disease; and mucosal immunity and molecular approaches to vaccine development.

**Endocrinology/Pharmacology** research areas include regulation and actions of the vitamin D endocrine system; mechanism of action of insulin and insulin-like growth factors; prolactin as a growth factor in health and disease; hormonal and electric field regulation of bone development and growth; and molecular mechanisms for carcinogenesis (glioblastoma, breast and prostate cancer).

**Neurosciences** research areas include studies of the hypothalamic control of homeostatic and sexual function; molecular mechanisms of neurodevelopment, neuronal death and neurodegeneration with emphasis on the following diseases: Alzheimer's disease, Parkinson's disease, Autism, Fragile X/mental retardation, multiple sclerosis, Huntington's disease, stroke and pathogen-induced encephalitis.

**Admission** Applicants should have completed an undergraduate degree in one of the physical or biological sciences and must submit scores from the GRE General Test (verbal and quantitative). (GRE requirement not applicable to UCR Biomedical Sciences students applying for the M.D.–Ph.D.) Courses required for admission include one year each of general chemistry, organic chemistry, physics, and calculus and at least two years of biological sciences. Preferred upper-division courses in biology include vertebrate or human anatomy and physiology, embryology, genetics, cell biology, microbiology, immunology, and neurosciences.

## Doctoral Degree

The aim of the graduate program in Biomedical Sciences is to train Ph.D. scientists in a specific area of research specialization who also have enough general knowledge in the basic medical sciences to apply their research expertise to unraveling the basis of disease. This approach includes understanding not only pathogenic manifestations of disease but also the normal physiologic state. To accomplish this, the student completes a core and elective curriculum, the latter tailored to the student's research interests.

Core requirements include:

1. BMSC 229: Foundations of Translational Research
2. BMSC 232, 233, 234 and 235: Foundations of Medicine Series
3. BMSC 260A, BMSC 260B, BMSC 260C: Topics in Biomedical Research. The entire 3 quarter series is required in the first year of

graduate education.

4. BMSC 261: Methods in Biomedical Research. Enrollment required all 3 quarters of the first year of graduate education.
5. BMSC 252: General seminar in Biomedical Sciences (enrollment required each quarter)
6. BMSC 254: Graduate seminar in Biomedical Sciences (enrollment required each quarter)
7. BMSC 302: (one-quarter requirement, not required of M.D.–Ph.D. students)

Under normal circumstances, each student should complete core course work requirements 1–4 during the first year of studies.

At the end of the student's first full year of residence, the advisory committee for each student evaluates the progress of the student and recommends to the faculty whether the student should continue in the program.

In addition, prior to advancement to candidacy and at the beginning of each academic year, the student presents a written summary of the research progress and plans to the advisory committee. Continuation in the program depends on the advisory committee's positive evaluation of the student's research progress.

**Written and Oral Qualifying Examinations** Prior to advancement to candidacy, students must complete both parts of a qualifying examination. Part I consists of the preparation of a research proposal, to be written in the form of a grant proposal, including literature review, description of methods and experimental plans for the dissertation. This proposal should outline the research progress of the student to date and delineate the planned dissertation research aims and objectives. Part I is usually completed in the spring quarter of year 2 and no later than the fall quarter of year 3 of a student's graduate training. Part II consists of an oral comprehensive examination administered by a committee of five faculty members, at least one of whom is from outside the program. The student's research advisor does not serve on the oral qualifying committee. The oral comprehensive examination includes examination of the student's knowledge and understanding of material covered in the core courses and in the student's area of specialization. Part II must be completed no later than the end of year 3 of the student's graduate training.

**Research Project, Dissertation and Final Oral Examination** After successful completion of the qualifying exam and advancement to candidacy, the student completes the research project, submits a written dissertation, and defends the dissertation in a final oral examination.

**Normative Time to Degree** 15 quarters

## M.D.–Ph.D. Combined Degree

**Admission** The combined degree is offered to students admitted to the medical school phase of the Biomedical Sciences Program and to exceptional students from other four-year LCME-accredited medical schools. Normally, a student completes the first two years of medical school,

and then spends approximately three years in the Ph.D. part of the program before completing the M.D. degree. However, the track is also offered to students who have completed the M.D. degree. UCR Biomedical Sciences students may apply for admission concurrently with their applications to the medical school phase or any time after acceptance to the medical phase. For these students only, the MCAT is accepted in lieu of the GRE.

Students from other medical schools should apply in the fall of their sophomore or senior year. Applications from sophomores must be accompanied by official permission for an appropriate leave of absence. The GRE requirement is the same as for regular Ph.D. students.

## Master's Degree

The Biomedical Sciences Graduate Group offers an M.S. degree. No students are admitted directly into the program for work toward the master's degree. However, a Plan I (Thesis) or Plan II (Comprehensive Examination) M.S. degree is available in special circumstances when work leading to the Ph.D. degree cannot be completed. The student's advisory committee decides whether the master's degree is an appropriate alternative to the Ph.D. degree. This decision may be made at the end of the student's first year of residence or at other times in the student's career, particularly at the time of the qualifying examination.

## Course Descriptions

All Biomedical Sciences courses are listed and described under Biomedical Sciences.

Further information regarding graduate studies in Biomedical Sciences may be obtained from the Division of Biomedical Sciences.

# Botany and Plant Sciences

**Subject abbreviation: BPSC**

**College of Natural and Agricultural Sciences**

Mikeal L. Roose, Ph.D., Chair  
Department Office, 2132 Batchelor Hall  
Graduate Student Affairs (800) 735-0717  
or (951) 827-5688

Undergraduate Advising Center  
(951) 827-3579; [plantbiology.ucr.edu](http://plantbiology.ucr.edu)

### Professors

Edith B. Allen, Ph.D. *Community/Restoration Ecology*

Julia N. Bailey-Serres, Ph.D. *Genetics*  
Xuemei Chen, Ph.D. *Plant Cell and Molecular Biology*

Timothy J. Close, Ph.D. *Genetics*  
Darleen A. DeMason, Ph.D. *Botany*  
Norman C. Ellstrand, Ph.D. *Genetics*  
Exequiel Ezcurra, Ph.D. *Ecology*

Jodie S. Holt, Ph.D. *Plant Physiology*  
Anthony H. C. Huang, Ph.D. *Plant Cell and Molecular Biology*

Bai-Lian "Larry" Li, Ph.D. *Ecology*  
Carol J. Lovatt, Ph.D. *Plant Physiology*  
Adam J. Lukaszewski, Ph.D. *Genetics*  
Eugene A. Nothnagel, Ph.D. *Plant Physiology*  
Natasha Raikhel, Ph.D. *Ernst and Helen Leibacher Chair; Plant Cell Biology*

Mikeal L. Roose, Ph.D. *Genetics*  
J. Giles Waines, Ph.D. *Genetics*  
Linda L. Walling, Ph.D. *Genetics*  
Susan Wessler, Ph.D. *Distinguished Professor of Genetics*

Shizhong Xu, Ph.D. *Genetics*  
Zhenbiao Yang, Ph.D. *Plant Biology*

### Professors Emeriti

Charles W. Coggins, Jr., Ph.D.  
Arturo Gómez-Pompa, Ph.D.  
Anthony E. Hall, Ph.D.  
Robert L. Heath, Ph.D. *Plant Physiology and Biophysics*  
Lowell S. Jordan, Ph.D.  
Charles K. Labanuskas, Ph.D.  
Elizabeth M. Lord, Ph.D. *Botany/Developmental Biology*  
Rainer W. Scora, Ph.D.  
William W. Thomson, Ph.D.  
Irwin P. Ting, Ph.D.

### Associate Professor

Sean Cutler, Ph.D. *Plant Cell Biology*  
Thomas A. Eulgem, Ph.D. *Plant Cell Biology*  
Thomas Girke, Ph.D. *Bioinformatics*  
Patricia S. Springer, Ph.D. *Genetics*

### Assistant Professors

Venugopala R. Gonehal, Ph.D. *Plant Cell Biology*  
Darrel Jenerette, Ph.D. *Landscape Ecology*  
Renyi Liu, Ph.D. *Evolutionary Genomics*  
Louis Santiago, Ph.D. *Physiological Ecosystems*  
Matthew S.H. "Harley" Smith, Ph.D. *Plant Cell Biology*

\*\*

### Lecturers

Mary Lu Arpaia, Ph.D. *Subtropical Horticulture*  
James Baird, Ph.D. *Turfgrass Horticulture*  
David A. Grantz, Ph.D. *Agronomy and Plant Physiology*  
Milton E. McGiffen, Jr., Ph.D.  
*Vegetable Crops/Plant Physiology*  
Alan McHughen, Ph.D. *Plant Biotechnology*  
Donald J. Merhaut, Ph.D.  
*Horticulture and Floriculture*

### Affiliated Emeritus

Junji Kumamoto, Ph.D. (Chemist Emeritus)

### Cooperating Faculty

Michael Allen, Ph.D., (Plant Pathology and Microbiology)  
Hailing Jin, Ph.D (Plant Pathology and Microbiology)  
Isgouhi Kaloshian, Ph.D. (Nematology)  
David R. Parker, Ph.D. (Environmental Sciences)  
Joel Sachs, Ph.D. (Biology)

## Major

The mission of the interdepartmental Undergraduate Program in Plant Biology is to provide students with a solid background in modern principles and research practices of basic Plant Biology and in their area of specialization.

Courses prerequisite to the major, courses used to satisfy major requirements, and the 16 units (for B.S. degree) related to the major must be taken for letter grades. Students may elect to take other courses on a Satisfactory (S)/No Credit (NC) basis. Refer to the Academic Regulations section of this catalog for additional

information on "S/NC" grading.

Information about this program is available from the CNAS Academic Advising Center (1223 Pierce Hall, Monday through Friday, 9 a.m. to noon and 1 to 4 p.m., [951] 827-7294).

## Transfer Students

Students planning to transfer to UCR with a major in Plant Biology must have a minimum GPA of 2.7 in transferable college courses and "C" or higher grades in a year sequence of general chemistry and in courses equivalent to our BIOL 005A, BIOL 005B. We also recommend that transfer students complete a year of college calculus before admission. Exceptions may be granted by the faculty advisor.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

## Major Requirements

The major requirements for the B.S. and B.A. degrees in Plant Biology are as follows:

1. Life Sciences core requirements (68-72 units)

Students must complete all required courses with a grade of "C-" or better and with a cumulative GPA in the core courses of at least 2.0. Grades of "D" or "F" in two core courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C

b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C, CHEM 112A, CHEM 112B, CHEM 112C

c) MATH 008B or MATH 009A, MATH 009B (MATH 009C recommended)

d) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 021A, PHYS 021B, PHYS 021C

e) STAT 100A

f) BCH 100 or BCH 110A (BCH 110A is strongly recommended)

**Note** for the B.S. degree, courses in Statistics and Biochemistry taken as part of the core may count toward the 16 units from an area of specialization. For the B.A. degree, courses in Statistics and Biochemistry taken as part of the core may not count toward the 12 units required from an area of specialization.

2. Upper-division requirements (40-52 units)

A GPA of at least 2.0 in upper-division courses taken in the field of the major is a graduation requirement. A student is subject to discontinuation from the major whenever

the GPA in upper-division course work is below 2.0. Students finding themselves in this circumstance must meet with an advisor.

- a) BIOL 102
- b) BPSC 104/BIOL 104 (may be waived with consent of the faculty advisor)
- c) BIOL 132/BPSC 132, BIOL 143/BPSC 143, BPSC 133
- d) At least 8 units for B.S. or 4 for B.A. from the following:  
BIOL 100/ENTM 100, BIOL 120/MCBL 120/PLPA 120, BIOL 120/MCBL 120/PLPA 120L, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L, BIOL 159/NEM 159, BPSC 134/ENSC 134/SWSC 134, ENSC 120/NEM 120/SWSC 120, ENTM 124
- e) Two (2) units of BPSC 195H, BPSC 197, BPSC 198-I, or BPSC 199
- f) BPSC 193 with a grade of C- or better
- g) **For the B.S.** 16 additional units from one of the four areas of specialization (consult with a faculty advisor) and additional upper-division courses in biological sciences and related areas from any of the areas of specialization lists, and students may apply a maximum of 6 units of BPSC 190 and/or BPSC 195H and/or BPSC 197 and/or BPSC 198-I and/or BPSC 199. Requirements a) through g) must be at least 52 units in total.

**For the B.A.** 12 additional units from one of the four areas of specialization (consult with a faculty advisor).

**Note** Students planning a B.A. degree should schedule the required language courses in place of a series of electives.

## Areas of Specialization

Individual student career goals may be achieved by selecting an area of specialization within the diverse disciplines of botany and plant sciences. Adjustments within these programs can be made to accommodate students' interests. Students must consult with a faculty advisor to clarify educational goals and to plan a program of study.

1. Plant Cellular, Molecular, and Developmental Biology
  - a) BPSC 135
  - b) Additional units from the following to meet either the B.S. or B.A. requirement: BCH 102, BCH 110B, BCH 110C or BIOL 107A, BCH 153/BIOL 153/BPSC 153, BCH 162, BCH 183/BPSC 183, BIOL 107B, BIOL 113, BIOL 114, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL 123/PLPA 123, BIOL 155/BPSC 155, BIOL 168, BPSC 138/BIOL 138, BPSC 185, CBNS 101, CBNS 108

2. Plant Genetics, Breeding, and Biotechnology
  - a) BPSC 150
  - b) Additional units from the following to meet either the B.S. or B.A. requirement: BCH 153/BIOL 153/BPSC 153, BIOL 105, BIOL 107A, BIOL 107B, BIOL 108, BIOL 119, BIOL 148/BPSC 148, BIOL 155/BPSC 155, BPSC 135, BPSC 158, BPSC 185, CBNS 108
3. Ecology, Evolution, and Systematics
  - a) BPSC 146
  - b) Additional units from the following to meet either the B.S. or B.A. requirement: ANTH 170/BPSC 170, BIOL 105, BIOL 108, BIOL 112/BPSC 112/ENTM 112, BIOL 116, BIOL 116L, BIOL 117, BIOL 138/BPSC 138, BIOL 165/BPSC 165, BPSC 134/ENSC 134/SWSC 134, BPSC 158, BPSC 166, BPSC 185, ENSC 100/SWSC 100, GEO 151, GEO 153, GEO 169
4. Plant Pathology, Nematology, and Pest Management
  - a) BIOL 120/MCBL 120/PLPA 120
  - b) Additional units from the following to meet either the B.S. or B.A. requirement: BCH 183/BPSC 183, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 124/MCBL 124, BPSC 133, BPSC 146, BPSC 150, BPSC 158, BPSC 166, ENSC 134/SWSC 134/BPSC 134, ENTM 100/BIOL 100, ENTM 109, ENTM 124, ENTM 127/BIOL 127, ENTM 129, ENTM 129L, ENSC 100/SWSC 100, ENSC 120/NEM 120/SWSC 120, NEM 159/BIOL 159, PLPA 120/BIOL 120/MCBL 120, PLPA 120L/BIOL 120L/MCBL 120L, PLPA 123/BIOL 123/MCBL 123, PLPA 134/BIOL 134, PLPA 134L/BIOL 134L, SWSC 104/ENSC 104

## Minor

The minor in Plant Biology allows students majoring in other departments to obtain in-depth training in Plant Biology.

Requirements for the minor in Plant Biology are as follows:

1. BIOL 104/BPSC 104 (4 units)
2. One course (4–5 units) from the following: BIOL 132/BPSC 132, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BPSC 133
3. Twelve (12) to 20 units from the following: ANTH 170/BPSC 170, BCH 183, BCH 153/BIOL 153/BPSC 153, BIOL 132/BPSC 132, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BIOL 148/BPSC 148, BIOL 155/BPSC 155, BIOL 165/BPSC 165, BPSC 133, BPSC 134/ENSC 134/SWSC 134, BPSC 135, BPSC 146, BPSC 150, BPSC 158, BPSC 166, BPSC 190, BPSC 195H, BPSC 197,

BPSC 198-I, BPSC 199, PLPA 120/BIOL 120/MCBL120

**Note** No more than 4 units of BPSC 190–199 may be used to fulfill this requirement. The course used to fulfill the requirement in 2. cannot also be used to fulfill the requirement in 3.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Graduate Program

The Department of Botany and Plant Sciences offers programs leading to the M.S. degree in Plant Biology with two tracks, Botany or Plant Science, and a program leading to Ph.D. degrees in Plant Biology or Plant Biology (Plant Genetics)\*. Research in these programs can focus on basic and/or applied questions.

**Admission** Applicants who have a baccalaureate degree and who satisfy the general requirements of the university listed in the Graduate Studies section of this catalog are considered for admission to graduate status. Students applying to the Ph.D. program and domestic applicants to the M.S. program must submit GRE General Test scores (verbal, quantitative, and analytical).

Regardless of the area of their major for the baccalaureate degree, students must have had, or complete soon after entering graduate school the following:

1. A year of course work in general biology and general chemistry
2. A course in genetics, biochemistry, and calculus
3. Two courses in physics and/or statistics.

Credit from these courses does not count toward the graduate degree.

Immediately after being admitted, each student should identify a faculty advisor and consult with that advisor or the graduate advisor regarding educational goals; scheduling initial course work and possible lab rotations; and forming a guidance committee. Further guidance on these matters is provided in the Botany and Plant Sciences Graduate Student Handbook.

## Master's Degree

The Department of Botany and Plant Sciences offers programs leading to the M.S. degree in Plant Biology with tracks in Botany or Plant Science.

The master's degree may be earned under Plan I (Thesis) or Plan II (Comprehensive Examination). Students must meet all general requirements of the Graduate Division. The detailed course program is determined by the guidance committee after considering the specific interests of the student. Department requirements are as follows:

**Plan I (Thesis)**

1. Three courses from Section I of either the Botany track or the Plant Science track M.S. list
2. Two courses from Section II. In fulfilling the Section II requirement, students may use no more than one course cross-listed by Botany and Plant Sciences and another program. If such a cross-listed course is used toward fulfilling the Section II requirement, the same course may not be used toward fulfilling the Section I or III requirements.
3. At least 6 units from Section III of either the Botany track or Plant Science track M.S. list
4. Preparation of a thesis (not more than 12 units from Section V may apply toward the degree)

If the student takes research courses from Section IV, not more than 6 units may be applied toward the degree. Students who have taken courses comparable to those in Section I during their baccalaureate training may have a portion or all of this section waived. In such instances, however, it is expected that their programs include increased units in courses from Sections II, III, and/or IV. Recommendations for waivers should specify alternative courses and should be sent to the department educational advisory committee for approval.

**Plan II (Comprehensive Examination)**

1. Three courses from Section I of either the Botany track or Plant Science track M.S. list
2. Two courses from Section II. In fulfilling the Section II requirement, students may use no more than one course cross-listed by Botany and Plant Sciences and another program. If such a cross-listed course is used toward fulfilling the Section II requirement, the same course may not be used toward fulfilling the Section I or III requirements.
3. At least 12 units from Section III of either the Botany track or Plant Science track M.S. list
4. At least 6 units from Section IV for a research project or literature review, which should be described in a report to be submitted for evaluation by the comprehensive examination committee
5. Comprehensive written and oral examinations

Students who have taken courses comparable to those in Section I during their baccalaureate training may have a portion or all of this section waived. In such instances, however, it is expected that their programs include increased units in courses from Section II and/or III. Recommendations for waivers should specify alternative courses and should be sent to the educational advisory committee for approval.

**Seminar Requirement** All full-time students must enroll in the BPSC 250 seminar during each quarter in which it is offered. Part-time students must take one BPSC 250 seminar for every 12 units of courses. One quarter per year, students may enroll in an equivalent seminar course as a replacement for the BPSC 250 seminar course. All students must present at

least one BPSC 250 seminar and complete at least two quarters of BPSC 240 (or equivalent).

**Courses available for fulfilling the requirement for the M.S. degree:**

**Section I** — Upper-division undergraduate courses:

**Botany track** ANTH 170/BPSC 170, BCH 153/BIOL 153/BPSC 153, BCH 183/BPSC 183, BIOL 104/BPSC 104, BIOL 112/BPSC 112/ENTM 112, BIOL 120/MCBL 120/PLPA 120, BIOL 132/BPSC 132, BIOL 134/PLPA 134, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BIOL 155/BPSC 155, BIOL 165/BPSC 165, BPSC 133, BPSC 134/ENSC 134/SWSC 134, BPSC 135, BPSC 146, BPSC 148, BPSC 166

**Plant Science track** ANTH 170/BPSC 170, BCH 153/BIOL 153/BPSC 153, BCH 183, BIOL 104/BPSC 104, BIOL 112/BPSC 112/ENTM 112, BIOL 120/MCBL 120/PLPA 120, BIOL 132/BPSC 132, BIOL 134/PLPA 134, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BPSC 148, BPSC 150, BIOL 155/BPSC 155, BIOL 165/BPSC 165, BPSC 133, BPSC 134/ENSC 134/SWSC 134, BPSC 135, BPSC 146, BPSC 158, BPSC 166

**Section II** — Graduate and upper-division undergraduate courses in related departments or programs: applicable courses are determined by the educational advisory committee and require approval of the graduate advisor.

**Section III** —

**Botany track** BCH 205/BPSC 205/CMDB 205/GEN 205/MCBL 205/PLPA 205, BCH 231/BPSC 231, BPSC 201 (E-Z) (for a maximum of 2 units), BPSC 210, BPSC 230, BPSC 232, BPSC 234, BPSC 237, BPSC 239, BPSC 240 (only if taken in addition to the required seminar units; see seminar requirement), BPSC 243, BPSC 245, BPSC 247

**Plant Science track** BCH 205/BPSC 205/CMDB 205/GEN 205/MCBL 205/PLPA 205, BCH 231/BPSC 231, BPSC 201 (E-Z) (for a maximum of 2 units), BPSC 221, BPSC 222, BPSC 232, BPSC 234, BPSC 237, BPSC 239, BPSC 240 (only if taken in addition to the required seminar units; see seminar requirement), BPSC 243, BPSC 245, BPSC 247

**Section IV** — Research courses: BPSC 290 and BPSC 297

**Section V** — Thesis research: BPSC 299, Thesis for Plan I

**Normative Time to Degree** 7 quarters

**Doctoral Degree**

The Department of Botany and Plant Sciences offers programs leading to Ph.D. degrees in Plant Biology or Plant Biology (Plant Genetics)\*.

The student must meet the general requirements of the Graduate Division.

\* The Plant Biology (Plant Genetics) program is in the process of being phased out and replaced by a concentration in Plant Genetics within the Plant Biology program.

**Admission** Either prior to entering the graduate program or before advancement to candidacy, students must have completed the equivalent of BPSC 104 and one other course from the core plant biology courses (BIOL 107A, BPSC 132, BPSC 135, BPSC 138, BPSC 143, BPSC 146). Course requirements for each student are determined by individual guidance committees and by the educational advisory committee. No later than the second quarter in residence, students meet with a guidance committee to (1) determine a course program to be submitted to the educational advisory committee, and (2) choose a major area of specialization and two minor areas.

**Course Work** Guidance committees and students should design individual course programs that meet the specific needs of the student and the requirements of the Ph.D. program. Course programs should prepare students for the qualifying examination and dissertation research. All first-year students must enroll in BPSC 200A and 200B during their first Fall and Winter quarters. Students must take a minimum of 12 additional graduate-level units relevant to the specialization. Graduate courses taken previously may be considered towards fulfilling this requirement. Students' course programs must be approved by the educational advisory committee. At the time of submission of course programs to the educational advisory committee, the area of specialization and two minor areas to be covered on the qualifying examination should be specified. Students may petition to change the course program, area of specialization, or minor areas at any time.

Students entering the Plant Biology Ph.D. program have four choices, as listed below. Students with a general interest in plant biology and/or evolution are encouraged to choose the first.

**Ph.D. in Plant Biology** Students who choose to obtain a Ph.D. in Plant Biology without one of the following concentrations are encouraged to – with the advice and consent of their Major Professor and Guidance Committee – create a set of coursework that is specifically tailored to their individual research interests and career objectives.

Students can also choose from one of three concentrations:

**Ph.D. in Plant Biology (Concentration in Plant Cell, Molecular, and Developmental Biology)** To earn the concentration in Plant Cell, Molecular, and Developmental Biology (appears on the transcript only), students must complete BPSC 231, BPSC 232, and BPSC 237. In addition, the required BPSC 240 course must be on a topic related to the concentration.

**Ph.D. in Plant Biology (Concentration in Plant Ecology)** To earn the concentration in Plant Ecology (appears on the transcript only), students must complete BPSC 245, and 8 additional units from the following list: BIOL 211, BIOL 212, BIOL 217, BIOL 230, BPSC 225J, BPSC 243, BPSC 247, ENTM 241, ENSC 218, ENSC 232, GEO 260, and GEO 268. In addition, the required BPSC 240 course must be on a topic related to the concentration.

**Ph.D. in Plant Biology (Concentration in Plant Genetics)** To earn the concentration in Plant Genetics (appears on the transcript only), students must complete 12 graduate-level units relating to Genetics. Required courses must include two courses from the following list: BPSC 221, BPSC 222, BPSC225K, BPSC 231, BPSC 234, BIOL 214, BIOL 221/MCBL 221/PLPA 226, GEN 240A. The additional units can be chosen in an area that supports the concentration. In addition, the required BPSC 240 course must be on a topic related to the concentration.

#### Written and Oral Qualifying Examinations

Advancement to candidacy depends on the student passing written and oral qualifying examinations. The qualifying examination covers the student's area of specialization and two minor areas. Granting of the degree is contingent upon acceptance of the dissertation by the candidate's dissertation committee and satisfactory oral defense of the dissertation.

**Seminar Requirement** All candidates must enroll in the BPSC 250 seminar during each quarter in which it is offered. One quarter per year, students may enroll in an equivalent seminar course as a replacement for the BPSC 250 seminar course. The dissertation defense is normally presented in the BPSC 250 seminar series; however, if necessary, a special seminar may be scheduled for the defense. Also, students must present at least one BPSC 250 seminar in addition to the defense of the dissertation. All students must complete at least one quarter of BPSC 240 (or approved similar equivalent that involves substantial student presentations) during the Ph.D. program.

**Foreign Language Requirement** None

**Teaching Requirement** Students must obtain at least one quarter of teaching experience.

**Normative Time to Degree** 15 quarters

**Normative Time to Candidacy** 2 years

## Lower-Division Courses

**BPSC 011. Plants and Human Affairs (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction for nonscience and non-Botany majors to the importance of plants and plant products in the shaping of human affairs and civilization. Covers the origin and practice of agriculture; the utilization of plant products; the latest agricultural advances, including genetic engineering; and the current agricultural and social issues. Plants and plant products are examined during class demonstrations and exercises. **Close, Huang**

**BPSC 021. California's Cornucopia: Food from the Field to Your Table (5) S** Lecture, 3 hours; discussion, 1 hour; outside activities, 30 hours per quarter.

Prerequisite(s): none. Examines California's diverse agricultural products. Addresses related contemporary issues such as crop improvement by biotechnology, climate change, pollution, resource use, and nutrition. Also examines how the interplay of geography, history, and culture shapes the cuisine of a region. **Ellstrand, Walling**

**BPSC 031. Spring Wildflowers (4) S** Lecture, 3 hours; laboratory, 3 hours; one Saturday field trip.

Prerequisite(s): none. General approach to the study of vegetative and floral features of plants as a means of identification and botanical classification of major plant families in Southern California. Secondary emphasis on the field biology of flowering plants. **Ezcurra**

**BPSC 097. Lower-Division Research (1-4)** Individual study, 3-12 hours. Prerequisite(s): consent of instructor. Involves special research projects in plant biology performed under faculty supervision. Requires a final written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

## Upper-Division Courses

**BPSC 104. Foundations of Plant Biology (4) F, S**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C. A study of the plant world from cells to ecosystems. Examines the structure and function of organisms from the major plant groups and their role in the biosphere. The laboratory explores the unique properties of plants. Cross-listed with BIOL 104.

**BPSC 112. Systematics (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification. Topics include phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchy of categories, and nomenclature. Cross-listed with BIOL 112 and ENTM 112.

**BPSC 132. Plant Anatomy (5) F** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): BIOL 005A and BIOL 005B, or consent of instructor. Functional and developmental aspects of plant cell, tissue, and organ structure. All aspects of the flowering plant life cycle are covered from germination to pollination and fruit and seed development. Cross-listed with BIOL 132. **DeMason**

**BPSC 133. Taxonomy of Flowering Plants (5)** Lecture, 3 hours; laboratory, 3 hours; three 1-day Saturday field trips. Prerequisite(s): BIOL 005C. Introduces the principles and methods of identifying, naming, and classifying flowering plants. Surveys selected flowering plant families in California and shows their interrelationships. **Waines**

**BPSC 134. Soil Conditions and Plant Growth (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104, ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; or consent of instructor. A study of the chemical, physical, and biological properties of soils and their influence on plant growth and development. Topics include soil-plant water relations; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses and rhizosphere processes. Cross-listed with ENSC 134 and SWSC 134. **Parker**

**BPSC 135. Plant Cell Biology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 110A; or consent of instructor. Explores concepts of dynamic plant cell structures and functions

as revealed by modern technologies such as genetic manipulation and live-imaging of cellular structures and molecules. **Yang**

**BPSC 138. Plant Developmental Morphology (4) W**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BIOL 005C, CHEM 112C, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently), PHYS 002C, PHYS 002LC; or consent of instructor. Introduces the key areas of research in plant morphology and developmental biology. Emphasizes flowering plants (angiosperms). Cross-listed with BIOL 138. **Smith, Springer**

**BPSC 143. Plant Physiology (4) W** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently), BIOL 104/BPSC 104; or consent of instructor. A survey of the fundamental principles of plant physiology, including photosynthesis, respiration, water relations, mineral nutrition, growth, morphogenesis, plant hormones, dormancy, and senescence. Cross-listed with BIOL 143. **Lovatt**

**BPSC 146. Plant Ecology (4)** Lecture, 3 hours; laboratory, 18 hours per quarter; field trip, 12 hours per quarter. Prerequisite(s): BIOL 104/BPSC 104 or BIOL 116 or consent of instructor. A study of the fundamentals of plant ecology emphasizing community ecology, environment, life histories, population dynamics, species interactions, succession, ecosystem and landscape ecology, and plant conservation ecology. **Allen**

**BPSC 148. Quantitative Genetics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, BIOL 102, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, STAT 100B; or consent of instructor. Examines approaches to studying the genetic basis of polygenic, metric traits. Includes types of gene action, partitioning of variance, response to selection, and inferring the number and location of quantitative trait loci. Cross-listed with BIOL 148. **Xu**

**BPSC 150. Genes, Selection, and Populations (4) W, Even Years**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102; upper-division standing. Considers the conscious manipulation of allelic frequencies in populations as the basis for domestication of crop and animal species. Examines the genetic basis and standard strategies for the improvement of targeted characteristics in populations of plants and animals through selection and introgression of specific genes and gene constructs. **Close, Lukaszewski**

**BPSC 153. Plant Genomics and Biotechnology**

**Laboratory (4) F, Even Years** Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BCH 110C or BIOL 107A; upper-division standing; consent of instructor. A study of modern techniques in plant genome modification. Topics include nucleic acid cloning and sequencing; plant tissue culture and genetic transformation; controlled-environment plant growth; gene mapping; and germplasm collections. Also explores the history of plant biotechnology; economic, agricultural, nutritional, medicinal, and societal relevance; and regulatory issues. Cross-listed with BCH 153 and BIOL 153. **Close**

**BPSC 155. Chromosomes (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A (BCH 100

or BCH 110A may be taken concurrently); or consent of instructor. An examination of the structure, function, and behavior of eukaryotic chromosomes. Cross-listed with BIOL 155. **Lukaszewski**

**BPSC 158. Subtropical and Tropical Horticulture (4) F, Even Years** Lecture, 4 hours; occasional field trips. Prerequisite(s): BIOL 005C or BIOL 104/BPSC 104 or consent of instructor. Studies the important subtropical and tropical crops of the world, emphasizing fruits, including citrus and avocado, with special reference to their botany, germplasm resources, climatic adaptation, and culture. **Waines**

**BPSC 165. Restoration Ecology (4)** Lecture, 3 hours; two 1-day field trips; three half-day field trips. Prerequisite(s): BIOL 104/BPSC 104 or BIOL 116 or ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; CHEM 112A; STAT 100A (STAT 100A may be taken concurrently); or consent of instructor. BIOL 102 and CHEM 112C are recommended. An examination of the basic ecological principles related to land restoration. Topics include enhanced succession, plant establishment, plant adaptations, ecotypes, weed colonization and competition, nutrient cycling, functions and reintroduction of soil microorganisms, restoration for wildlife, and the determination of successful restoration. Includes field trips to restored sites. Cross-listed with BIOL 165. **Allen**

**BPSC 166. Plant Physiological Ecology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C or consent of instructor; university-level courses in mathematics, physics, and chemistry are recommended. Topics include plant responses to light, temperature, evaporative demand, and limiting soil conditions. Explores photosynthesis, plant-water relations, and plant-temperature relations. Gives attention to plant adaptation to climates with varying aridity and temperature extremes. **Santiago**

**BPSC 170. Ethnobotany (4) F** Lecture, 2 hours; seminar, 1 hour; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104 or consent of instructor. Introduces students to ethnobotanical research by reviewing selected ethnobotanical studies. Topics covered by lectures include fundamental principles of ethnobotany, the search for new medicines and other products made from plants, the role of humans in plant evolution, and the impact of plants on human cultures. Discussions focus on the past and present role of humans in plant conservation and the search for sustainable management practices in agriculture and forestry. Seminars by invited guests and enrolled students present selected topics in ethnobotany. Cross-listed with ANTH 170.

**BPSC 183. Plant Biochemistry (3)** Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B; or BCH 100; or consent of instructor. The course is designed for the student interested in plant biochemistry who wishes to become informed about biochemical structures, systems and metabolic pathways which are unique to plants; for example, photosynthesis, nitrogen fixation, cell walls, and seed development and germination. Cross-listed with BCH 183. **Eulgem**

**BPSC 185. Molecular Evolution (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 105 or BIOL 107A or consent of instructor; BIOL 108 is recommended. Explores the evolution of genes, proteins, and genomes at the molecular level. Focuses on the processes that drive molecular evolutionary change. Covers basic methodological tools for comparative and phylogenetic analyses of molecular data from an evolutionary perspective. **Liu**

**BPSC 190. Special Studies (1-5) F, W, S** variable hours. Library, laboratory or field work designed to

meet special curricular needs. A written proposal signed by the supervising faculty member must be approved by the major advisor and the Department Vice Chair. A written report must be filed. Course is repeatable, but total credit toward graduation may not exceed 6 units.

**BPSC 193. Senior Seminar (2) W** Seminar, 1 hour; lecture, 1 hour. Prerequisite(s): senior standing in Plant Biology. Emphasizes thinking across hierarchical levels and understanding structure-function relationships in plant biology. Includes lectures by instructors and presentation of classical or landmark papers by students. Satisfactory (S) or No Credit (NC) grading is not available.

**BPSC 195H. Senior Honors Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): upper division standing; admission to the University Honors Program or consent of instructor. Directed research and completion of a senior Honors thesis under the supervision of a faculty member. Course is repeatable to a maximum of 12 units.

**BPSC 197. Research for Undergraduates (1-4) F, W, S** Outside research, 3-12 hours. Prerequisite(s): upper-division standing; consent of instructor. Individual research conducted under the direction of a Botany and Plant Sciences faculty member. A written proposal must be approved by the supervising faculty member and undergraduate advisor. A written report must be filed with the supervising faculty member at the end of the quarter. Course is repeatable.

**BPSC 198-I. Individual Internship in Botany and Plant Sciences (1-12)** Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): upper-division standing; consent of instructor. An off-campus internship related to plant biology. The student conducts the internship in the public or private sector but is jointly supervised by an off-campus sponsor and a faculty member in Botany and Plant Sciences. Requires an initial written proposal and a final written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**BPSC 199. Senior Research (2-4) F, W, S** Laboratory, 6-12 hours. Prerequisite(s): senior status; a GPA of 3.2 or better in upper-division courses in Botany/Plant Science and Biology; or consent of instructor. Individual research on a problem relating to Botany/Plant Science. A written proposal signed by the supervising faculty member must be approved by the major advisor and the Department Vice Chair. A written report must be filed with the supervising faculty member. Course is repeatable, but total credit toward graduation may not exceed 9 units.

## Graduate Courses

**BPSC 200A. Plant Biology Core (2) F** Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): graduate standing in Plant Biology or consent of instructor. Explores plant biology research approaches. Emphasizes critical thinking and advanced planning of hypothesis testing, as well as experimental/descriptive/theoretical caveats, trade-offs, and options. Presents topics in a case-study approach. Also addresses professional development. Graded Satisfactory (S) or No Credit (NC). **Walling**

**BPSC 200B. Plant Biology Core (2) W** Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): BPSC 200A. Builds on material covered in BPSC 200A. Focuses on creating complete grant proposals based upon the guidelines of an actual funding source. Presents topics in a case-study approach. Includes peer review of completed proposals. **Walling**

**BPSC 201 (E-Z). Methods in Plant Biology (1-2) F, S, W** Laboratory, 3-6 hours. Prerequisite(s): consent of instructor. Explores the theory and principles of instruments and laboratory techniques applicable to research in the plant sciences. Experiments provide experience in the use of laboratory instruments and techniques including applications and limitations. E. Plant Molecular Biology; F. Plant Ecology; G. Plant Systematics; I. Plant Microscopy; J. Plant Physiology; K. Plant Genetics; M. Plant Cell Biology; N. Plant Cytogenetics. Segments are repeatable as content changes.

**BPSC 205. Signal Transduction Pathways in Microbes and Plants (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in the biological sciences, BIOL 107A or BIOL 113 or BIOL 114 or CBNS 101; or consent of instructor. Advanced topics in signal transduction pathways that regulate growth and development in plants and prokaryotic and eukaryotic microbes. Areas covered include two-component regulatory systems; quorum sensing; signaling via small and heterotrimeric G proteins; mitogen-activated protein kinase cascades; cAMP signaling; photoreceptors; plant hormone signaling; responses to low-oxygen stress; calcium signaling; and plant pathogenesis. Cross-listed with BCH 205, CMDB 205, GEN 205, MCBL 205, and PLPA 205.

**BPSC 210. Methods In Arabidopsis Research (4) F, Odd Years** Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102; consent of instructor. A study of modern techniques used in Arabidopsis research. Topics include plant growth conditions, pest control, genetic crosses, chemical and insertional mutagenesis, genetic mapping techniques, nucleic acid isolation and manipulation, transformation, and internet resources. **Eulgem**

**BPSC 221. Advanced Plant Breeding (4) S, Even Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 148/BPSC 148 or consent of instructor; BPSC 150. Advanced treatment of plant breeding theory and practice including development and use of information on inheritance of traits; choice of breeding plans; breeding for yield, quality, and disease and stress resistance; and use of biotechnology. **Roose**

**BPSC 222. Origins of Agriculture and Crop Evolution (3) W, Odd Years** Lecture, 3 hours. Prerequisite(s): BIOL 102, BIOL 104/BPSC 104; or consent of instructor. Analysis of origins of agriculture in the Near East, China, the New World, and Africa. Survey of domestication and evolution of major crop plants and animals. **Waines**

**BPSC 225 (E-Z). Advanced Topics in Plant Biology (2) F, W, S** Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An in-depth examination of selected topics in plant biology. E. Agricultural Plant Biology; F. Plant Cell Biology; G. Plant Development; I. Plant Evolution and Systematics; J. Plant Ecology; K. Plant Genetics; M. Plant Molecular Biology; N. Plant Biochemistry and Physiology. Each segment is repeatable as its content changes.

**BPSC 230. Molecular Plant-Microbial Interactions (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120/MCBL 120/PLPA 120, or equivalents. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with CMDB 230, GEN 230, and PLPA 230.

**BPSC 231. The Plant Genome (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL

107A; or BCH 110A, BCH 110B, BCH 110C; or consent of instructor. Gives students an appreciation for the structure of the plant nuclear, chloroplast, and mitochondrial genomes. Gene structure, regulation of gene expression, transposons, and methods of gene introduction are also emphasized. Cross-listed with BCH 231. **Bailey-Serres, Eulgem, Walling**

**BPSC 232. Plant Development (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102; BIOL 104/BPSC 104; or consent of instructor. An examination of plant development, with emphasis on the genetic mechanisms used in patterning plant forms. Topics are taken from current literature and focus on molecular and cellular mechanisms. **Springer**

**BPSC 234. Statistical Genomics (4) F, Even Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102, STAT 231B; or consent of instructor. Examines statistical methods of genome analysis. Topics include screening for genetic markers, linkage analysis, linkage disequilibrium, and mapping genes for complex diseases and quantitative traits. Covers statistical techniques, including analysis of least squares and maximum likelihood, Bayesian analysis, and Markov chain Monte Carlo algorithm. **Xu**

**BPSC 236. Principles of Light Microscopy (4) W** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): graduate standing in the life sciences or consent of instructor. Principles and practice of preparing biological tissues for light microscopy. Topics include bright field and variations on the compound microscope, fluorescence and confocal microscopy, fixation, histochemical methods, immunolocalization, *in situ* localization, and digital image analysis. **Carter, DeMason**

**BPSC 237. Plant Cell Biology (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or BIOL 143/BPSC 143 or BCH 100 or CBNS 101 or their equivalents, or consent of instructor. Studies the structure, function, and dynamics of plant cell division, expansion, and specialization. Emphasis on aspects unique to plants including cytoskeletal and cell plate dynamics during cytokinesis; intracellular trafficking and wall-dynamics during expansion; and targeting to chloroplasts and vacuoles during specialization. **Raikhel, Yang**

**BPSC 239. Advanced Plant Physiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 143/BPSC 143 or consent of instructor. Examines advances in plant physiology, with emphasis on carbon and nitrogen metabolism, mineral nutrition, solute transport and phloem translocation, plant growth regulators, and secondary compounds in relation to growth and development. **Lovatt**

**BPSC 240. Special Topics in Plant Biology (2) F, W, S** Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of current literature within special areas of plant science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BPSC 243. Plant Physiological Ecology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 143/BPSC 143; BPSC 146 or equivalent; or consent of instructor. Analyzes adaptations and responses of plants to their environment, with emphasis on the physical environment, photosynthesis, temperature and water relations, growth and allocation, and plant interactions. **Santiago**

**BPSC 245. Advanced Plant Ecology (4) F, Even Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC; STAT 100B or equivalent; an undergraduate course in ecology; or consent of instructor. Explores the fundamental ecological concepts, theoretical developments, quantitative methods, and experimental results involved in multiscale plant

ecological studies. Emphasizes plant strategies, vegetation processes, ecosystem properties, and terrestrial landscapes and their interaction with environmental change and human land use. **Li**

**BPSC 246. Landscape Ecology (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 116 or BPSC 146; STAT 100A; or consent of instructor. Introduces landscape ecology both as a sub-discipline of ecology and an interdisciplinary approach for environmental research. Includes identification of spatial patterns, pattern-process relationships, and scaling. Analyzes population, community, and ecosystem dynamics in connection with landscape functioning. Evaluates landscape theory and methods for applications in species conservation, pollution, and climate changes. **Jenerette**

**BPSC 247. Ecological Theory and Modeling (4) W, Even Years** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): MATH 009C or MATH 09HC; STAT 100B or equivalent; an undergraduate course in ecology; or consent of instructor. Explores the fundamental ecological theory and modeling methodology with emphasis on the ecosystem and landscape levels. Synthesizes current research developments in the context of their classic works. **Li**

**BPSC 250. Seminar in Plant Biology (1) F, W, S** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Intensive study of selected topics in plant biology. Includes lectures by students, faculty, and invited scholars on subjects related to the principles of plant biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**BPSC 252. Special Topics in Botany/Plant Science (1) F, W, S** Seminar, 1 hour. Prerequisite(s): graduate standing and consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each staff member. Course content will emphasize recent advances in the special topic area and will vary accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BPSC 261. Seminar in Genetics, Genomics, and Bioinformatics (1) W, S** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, ENTM 261, GEN 261, and PLPA 261.

**BPSC 290. Directed Studies (1-6) F, W, S** Individual study, 3-18 hours. Prerequisite(s): consent of instructor. Library, laboratory, or field studies conducted under the direction of a faculty member. Designed to meet special or unexpected curricular needs in areas of plant biology not covered by formal course work. Students who complete assigned extra work receive letter grades; other students receive Satisfactory (S) or No Credit (NC) grades. Course is repeatable.

**BPSC 291. Individual Study in Coordinated Areas (1-6) F, W, S** Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for examinations. Up to 6 units may be taken prior to the master's degree. Up to 12 units may be taken prior to advancement to candidacy for the Ph.D. Graded Satisfactory (S) or No Credit (NC). Course is repeatable upon recommendation of the instructor.

**BPSC 292. Concurrent and Advanced Studies in Botany and Plant Sciences (1-4) F, W, S** Outside research, 3-12 hours. Prerequisite(s): consent of instructor.

Elected concurrently with an appropriate undergraduate course, but on an individual basis. Devoted to one or more graduate projects based on research and criticism related to the course. Faculty guidance and evaluation is provided throughout the quarter. Course is repeatable.

**BPSC 297. Directed Research (1-6) F, W, S** Outside research, 3-18 hours. Prerequisite(s): graduate standing or consent of instructor. Individual research conducted under the direction of a Botany and Plant Sciences faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**BPSC 299. Research for Thesis or Dissertation (1-12) F, W, S** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

### BPSC 302. Teaching Practicum (1-4) F, W, S

Prerequisite(s): graduate standing and appointment as Teaching Assistant. Supervised teaching of Botany/Plant Science courses including laboratory and/or discussion sections. Graded Satisfactory (S) or No Credit (NC). Course is repeatable for credit, but units not applicable toward degree unit requirements.

## Business Administration

### Subject abbreviation: BUS The School of Business Administration

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#### Professors

Y. Peter Chung, Ph.D. (Finance)  
Bajis M. Dodin, Ph.D. (Operations and Supply  
Chain Management)  
Mohsen El-Hafsi, Ph.D. (Operations and Supply  
Chain Management)  
Donna Hoffman, Ph.D. *Albert O. Steffey Professor  
of Marketing* (Management and Marketing)  
Sarkis J. Khoury, Ph.D. (Finance)  
Woody M. Liao, Ph.D. (Accounting and Information  
Systems)  
Birendra Mishra, Ph.D. (Accounting and  
Information Systems)  
Theodore Mock, Ph.D. *Distinguished Professor*  
(Accounting and Information Systems)  
Michael Moore, Ph.D. (Accounting and Information  
Systems)  
Thomas Novak, Ph.D. (Management and  
Marketing)  
Annon Rapoport, Ph.D. *Distinguished Professor of  
Management* (Management and Marketing)  
Waymond Rodgers, Ph.D. (Accounting and  
Information Systems)  
Erik Rolland, Ph.D. (Accounting and Information  
Systems)  
Richard Smith, Ph.D. *Philip L. Boyd Chair*  
(Finance)  
David Stewart, Ph.D. *Distinguished Professor of*

*Marketing* (Management and Marketing)  
Yunzeng Wang, Ph.D. *Dean's Distinguished Scholar* (Operations and Supply Chain Management)  
Rami Zwick, Ph.D. (Management and Marketing)

**Professors Emeriti**

David Mayers, Ph.D. (Finance)  
Kathleen Montgomery, Ph.D. (Management and Marketing)

**Associate Professor**

Jorge Silva-Risso, Ph.D. (Management and Marketing)

**Associate Professor Emeritus**

Lawrence Zahn, Ph.D. (Management and Marketing)

**Assistant Professors**

Cecile Cho, Ph.D. (Management and Marketing)  
Long Gao, Ph.D. (Operations and Supply Chain Management)  
Andrea Godfrey, Ph.D. (Management and Marketing)  
Sukwon (Thomas) Kim, Ph.D. (Finance)  
Seok-Woo Kwon, Ph.D. (Management and Marketing)  
Yun Liu, Ph.D. (Finance)  
Xing Pan, Ph.D. (Management and Marketing)

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**Lecturers**

Francisca Beer, Ph.D. (Finance)  
Rafiqul Bhuyan, Ph.D. (Finance)  
Essia Hamouda, Ph.D. (Accounting and Information Systems)  
Sean Jasso, Ph.D. (Management and Marketing)  
Rosemary Kim, Ph.D. (Accounting and Information Systems)  
David Kung, Ph.D. (Operations and Supply Chain Management)  
Mohammad Oskoorouchi, Ph.D. (Operations and Supply Chain Management)  
Gary Patterson, J.D. (Accounting and Information Systems)  
Bruce Samuelson, D.B.A. (Accounting and Information Systems)  
Iryna Shevchuk, Ph.D. (Management and Marketing)  
Raj Singh, Ph.D. (Management and Marketing)  
Craig Weaver, M.B.A. (Accounting and Information Systems)

## Majors

The B.S. in Business Administration is a two-year upper-division major offered by the School of Business Administration (SoBA). Students can enroll in a Pre-Business status and are advised in CHASS during their freshman and sophomore years. The Pre-Business curriculum includes the prerequisites to the major and the college breadth requirements. After admission to the major, students are advised by the SoBA through its Office of Undergraduate Programs located at 2340 Olmsted Hall. The B.S. degree in Business Administration is conferred by the SoBA.

The program is accredited by the AACSB International - The Association to Advance Collegiate Schools of Business.

**Admission** A limited number of students are accepted into the Business Administration major, chosen according to overall GPA. Students must apply for the major when they have completed not fewer than 75 and not more

than 100 quarter units of college work. Final acceptance into the major is based on completion of all prerequisites and breadth requirements within a 100-quarter-unit limit, a GPA above 2.50 in prerequisites, and cumulative GPA of at least 2.50. (Students who have not completed the foreign language breadth requirement may be accepted into the program, but they must complete the requirement before graduation.) Exceptions to the 100-quarter-unit maximum must be requested by petition.

UCR Students (excluding Pre-Business students) interested in changing major to Business Administration will be admissible to the Business Preparatory (BSPR), (which is not a major in UCR, but a holding group of transfer students who appear to be qualified for admission into business administration, but have some deficiencies which need to be completed before admission into business administration) status only if they can complete their deficiencies in breadth and/or major prerequisites within one quarter (the first quarter after admission into Business Preparatory).

The same rule will apply to students transferring in from a community college or a four-year school. In the event these students fail to meet this one quarter requirement, they will not be admitted into the BSPR category, and will be advised to find another major at UCR.

Students are encouraged to participate in at least one internship during their junior or senior year. Students interested in international business are encouraged to consider opportunities for study through the Education Abroad Program, which has centers affiliated with more than 150 institutions in 35 countries worldwide. For further details, visit UCR's International Education Center at [international.center.ucr.edu](http://international.center.ucr.edu) or call (951) 827-4113.

Outstanding academic achievement is recognized by the awarding of the Delta Sigma Pi Scholarship Key to a graduating senior. Other awards, presented on an annual basis, include the Wall Street Journal's Student Achievement Award, the Bank of America Business Leaders Scholarship, Deloitte and Touche Scholarship, Gordon Blunden/Provident Savings Bank Business Scholarship, and the Ernst & Young Scholarship.

Graduating seniors are also eligible for the School of Business Administration Award for Academic and Service Excellence, and also the SoBA Concentration Area Awards, which recognizes the student with the best overall performance in each concentration area.

## University Requirements

See Undergraduate Studies section.

## College Requirements

Students must fulfill all breadth requirements of the College of Humanities, Arts, and Social Sciences or the Intersegmental General Education Transfer Curriculum prior to transferring to the UC.

## Major Requirements

The following are requirements leading to the B.S. degree in Business Administration. At least 50 percent of business course requirements must be completed at UCR.

### Business Administration Major

1. Preparation for Business Administration major (8 courses [at least 32 units])
  - a) General prerequisites (may be used to satisfy breadth requirements of the College of Humanities, Arts, and Social Sciences)
    - (1) ECON 002
    - (2) ECON 003
    - (3) CS 008
    - (4) STAT 048
    - (5) MATH 022
    - (6) ECON 102 or ECON 103
  - b) Major prerequisites (may not be used to satisfy breadth requirements)
    - (1) BUS 010
    - (2) BUS 020

The major requirements for the B.S. in Business Administration are as follows:

2. Upper-division major requirements (18 courses [at least 72 units])
  - Core courses (at least 10 courses [at least 40 units]):
    - a) BUS 101, BUS 103, BUS 105, BUS 108, BUS 109
    - b) BUS 104/STAT 104
    - c) BUS 106/ECON 134
    - d) BUS 107; or PSYC 142 and SOC 150 or SOC 151
    - e) BUS 100
    - f) BUS 102; or PHIL 116 and POSC 182 or POSC 186

Concentration (At least 20 units): Students in the Business Administration major (BSAD) will be required to declare a concentration at least three quarters prior to graduation, provided they be allowed to change their concentration, if justified. The Office of Undergraduate Business Programs will manage the process.

Choose five courses from one of the concentrations listed below. Courses completed to meet upper division core requirements may not be used to meet concentration requirements.

Accounting and Auditing: BUS 154A, BUS 159, BUS 160/ECON160, BUS 161, BUS 162/ECON 162, BUS 165A, BUS 165B, BUS 165C, BUS 166, BUS 167, BUS 168A, BUS 168B, BUS 169A, BUS 169B

Finance: BUS 131, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139, BUS 146, BUS 147, BUS 148, BUS 153/ECON153

General Management: BUS 143, BUS 144, BUS 145, BUS 146, BUS 147, BUS 148, BUS 154A, BUS 155, BUS 156, BUS 157, ANTH105/BUS 158, BUS 173, BUS 185

Information Systems: BUS 125, BUS 128, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 177

Marketing: BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 126

Operations and Supply Chain Management: BUS 122, BUS 125, BUS 126, BUS 127/STAT127, BUS 128, BUS 129, BUS 130, BUS 173

g) An additional 12 units of Business Administration elective courses excluding BUS 190. See department for a list of approved Business Administration elective courses.

### Double Concentration for Business Administration Students

Business Administration students can declare a second concentration within the School of Business Administration (SoBA). Declaring a second concentration is not permitted while on academic probation or during the last two quarters before graduation (150 units or more). Both concentrations must be completed within the maximum limit of 216 units, and approval must be obtained from his/her academic advisor. In such cases, all course requirements must be completed for each of the two concentrations chosen. If the student chooses a second concentration then he/she will be getting only one B.S. in Business, and the diploma will mention the primary concentration, but not the second concentration. However, if a business student wishes to add a second major in another college or school (other than SoBA), then he/she can. The Business major is the primary and the other major is the secondary. In this case he/she can be enrolled in only one concentration, and the rules of the second major will apply.

### Majors with Administrative Studies Components

B.A. degrees are offered in Art History, Economics, History, Political Science, and Sociology with Administrative Studies. A B.S. degree is offered in Sociology with Administrative Studies. Specified departmental requirements are listed under respective departmental listings.

- All requirements of the College of Humanities, Arts, and Social Sciences
- Specified requirements of the relevant department, to include at least 36 upper-division units in that discipline
- Administrative Studies requirements** (37 units)

- Four lower-division courses (17 units)
  - BUS 010, BUS 020
  - STAT 048 or equivalent (may be used to satisfy breadth requirements)
  - CS 008 (may be used to satisfy breadth requirements)

b) Two upper-division courses (8 units) from the list below:

- ECON 102 or ECON 104A or ECON 130 or ECON 162/BUS 162
- PSYC 140 or PSYC 142
- SOC 150 or SOC 151 or SOC 171
- POSC 181 or POSC 182 or POSC 183
- ANTH 127 or ANTH 131

These two courses must be outside the discipline of the relevant major and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.

c) A three-course track (12 units) in Business Administration courses, from one of the following:

- Organizations (General): BUS 100, BUS 107, BUS 176/SOC 176, BUS 158/ANTH 105, SOC 150, SOC 151
- Human Resources Management/Labor Relations: BUS 100, BUS 107, BUS 152/ECON 152, BUS 153/ECON 153, BUS 155, BUS 157, PSYC 142
- Business and Society: BUS 100, BUS 102, BUS 107, PHIL 116, POSC 182, POSC 186
- Marketing: BUS 103, and two from BUS 112, BUS 113, BUS 114 or BUS 117
- Managerial Accounting/Taxation: BUS 108, and two from BUS 166, BUS 168A, or BUS 168B
- Financial Accounting: BUS 108, BUS 165A, BUS 165B
- Finance: BUS 106/ECON 134 and two from BUS 134, BUS 136, BUS 137, BUS 138, BUS 139
- Management Information Systems: BUS 101, BUS 171, BUS 173
- Production Management: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

### Minor

Students declaring a minor in Business Administration will petition the Office of Undergraduate Business Programs at least three quarters prior to graduation. That office will publicize the deadlines each quarter to all colleges and major departments.

Prerequisites for the minor in Business Administration are as follows:

- Three lower-division courses (14 units) (must be completed with no grade lower than "C"): BUS 020, ECON 004, STAT 048

Requirements for the minor in Business Administration are as follows:

- Six upper-division courses (24 units):
  - Four courses from the following: BUS 101, BUS 103, BUS 104/STAT 104,

BUS 105, BUS 106/ECON 134, BUS 108, one of BUS 102 or PHIL 116

b) Two additional upper-division Business Administration courses.

## Lower-Division Courses

**BUS 010. Introduction to Business (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Provides an overview of the field of business administration. Areas covered include business goals and strategies, functional areas of business and their integration in policy and decision making, social responsibility, computers in business, and business trends and challenges including the international dimension.

**BUS 020. Financial Accounting and Reporting (4)** Lecture, 3 hours; discussion, 1 hour. A study of the concepts and techniques for measurement and communication of financial information. Includes interpretation of financial statements.

**BUS 021. Generation of Financial Accounting Information (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020 with a grade of "C-" or better. A detailed study of the process of measuring, recording, and communicating financial accounting information.

## Upper-Division Courses

**BUS 100. Management Communication (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing. Covers the theory and practice of communication in a business environment. Topics include written and oral presentations, interpersonal skills, teamwork in a multicultural setting, and effective use of communication technologies.

**BUS 100W. Management Writing and Communication (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper division standing or consent of instructor. Focuses on writing and communication methods in a business environment. Topics include written and oral presentations, interpersonal skills, teamwork in a multicultural setting, and effective use of communication technologies. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better.

**BUS 101. Information Technology Management (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 008 or equivalent; upper-division standing. Topics include computer hardware and software, business data processing, databases, telecommunications, systems analysis and design, cost-benefit analysis, and systems applications in business. Includes database and spreadsheet projects.

**BUS 102. Ethics and Law in Business and Society (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing. Analyzes the legal, ethical, political, and social aspects of the business environment. Topics include ethics and social responsibility, government regulation, corporate governance, and global management issues.

**BUS 103. Marketing and Distribution Management (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the role of marketing in society with emphasis on concepts, marketing methods, and institutions.

**BUS 104. Decision Analysis and Management Science (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 008 or equivalent; STAT 048 or STAT 100A or equivalent; upper-division standing. A

survey of deterministic and probabilistic models for decision making. Topics include linear programming and extensions, networks, dynamic programming, decision trees, queuing models, and simulation. Explores the application of these models in decision making. Emphasizes use of the computer. Cross-listed with STAT 104.

**BUS 105. Production and Operations Management (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 104/STAT 104 or equivalent. Deals with the issues of design and control of production systems in manufacturing and service organizations. Covers product and process selection, capacity planning, location and layout design, project and job scheduling, inventory control, material planning, and quality control.

**BUS 106. Introduction to Financial Management (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 101 or STAT 048; ECON 102 or ECON 104A; upper-division standing. An introduction to financial management and financial institutions. Includes time value of money, stock and bond valuation, risk and return, portfolio theory, capital budgeting, capital structure, dividend policy, and financial databases. Cross-listed with ECON 134.

**BUS 107. Organizational Behavior (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing. Studies organizations from the behavioral science perspective. Topics include motivation, leadership, communication, groups, organization structure and culture, and control in complex organizations.

**BUS 108. Financial Evaluation and Managerial Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020 or equivalent; upper-division standing. Study of accounting data used for managerial planning and controlling of business operations. Provides an introduction to manufacturing operations and cost accounting systems, cost-volume-profit analysis, relevant costing, standard costing and variance analysis, as well as budgeting.

**BUS 109. Competitive and Strategic Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): senior standing in Business Administration. An integrative course which provides an understanding of strategic decision-making processes in organizations, the interrelationships among functional areas, and how decision making is affected by internal and external environments. Teamwork and case studies are emphasized.

**BUS 111. Services Marketing (4)** Lecture, 3 hours; outside project, 3 hours. Prerequisite(s): BUS 103. Covers the marketing of services and ideas. Focuses on marketing for service organizations such as hotels, hospitals, and banks. Provides understanding of the broader role of service provision for both service firms and goods firms.

**BUS 112. Consumer Behavior (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 103. Provides a basic understanding of the general models of choice behavior as it relates to marketing decision making. Emphasis is on motivation, perceptions, learning, and social forces as they impact on the choice process.

**BUS 113. Marketing Institutions (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 103. Covers the concepts and strategies relating to the delivery of consumer goods and services, the main topic being the management of marketing activities within the channels of distribution, especially in retail and wholesale institutions.

**BUS 114. Marketing in a Global Environment (4)** Lecture, 3 hours; outside research, 2 hours; term paper, 1 hour. Prerequisite(s): BUS 103. Covers the

theory and practice of marketing across national borders. Provides an understanding of global marketing environments and examines the development of marketing strategies to maximize growth of global companies.

**BUS 115. Marketing Research (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): BUS 103. Covers types and sources of marketing information, the marketing research process, and techniques of data collection and analysis, including consumer and customer surveys and test marketing. Examines both quantitative and qualitative research with analysis of the values and limitations of data. Emphasis is placed on evaluation and interpretation of results.

**BUS 116. Pricing Strategy and Management (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): BUS 103 or consent of instructor. Integrates theory and practice into a framework for making pricing decisions. Prepares for addressing strategic and tactical pricing issues. Topics include customer demand and price sensitivity, psychological reaction to price, segmented pricing, price promotions, bundling, online pricing, dynamic pricing, competitive reaction, profitability analysis, and pricing strategy development.

**BUS 117. Advertising (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 103. Covers the basic concepts and functions of advertising, with emphasis on media selection, message design, and effectiveness measurement.

**BUS 118. Electronic Marketing (4)** Lecture, 3 hours; outside project, 3 hours. Prerequisite(s): BUS 103. An introduction to the role of electronic commerce in business-to-consumer and business-to-business marketing. Covers the application of traditional marketing principles to an electronic commerce environment and new marketing techniques made possible by this environment.

**BUS 119. Database Marketing (4)** Lecture, 3 hours; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): BUS 103. Examines marketing cases and develops data analytical skills for managerial decision making. Utilizes statistical software to manage, display, and analyze marketing information, including consumer survey, relationship management, scanner, and socioeconomic data. Topics include attitude measurement, market segmentation and targeting, competition analysis, market performance analysis, and store location choice.

**BUS 122. Linear Programming with Applications (4)** Lecture, 3 hours; homework problems and projects, 3 hours. Prerequisite(s): BUS 104/STAT 104 or equivalent. Investigates many real-life decision problems that give rise to linear programs with special structures, network flow problems, integer programs, and large-scale programs. Presents theory and algorithms of these models applied to various decision problems in management with use of computer packages.

**BUS 125. Simulation for Business (4)** Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): BUS 104/STAT 104, STAT 048, or equivalents. Introduces simulation as a tool for analyzing complex systems. Analyzes and discusses the theory and practice of modeling through simulation. Topics include modeling uncertainty and collecting input data, Monte Carlo simulation techniques, model verification and validation, and sensitivity analysis. Examines applications in finance, marketing, operations, and supply chain management.

**BUS 126. Practical Business Forecasting (4)** Lecture, 3 hours; assigned problems, 3 hours. Prerequisite(s): STAT 048 or STAT 100A or equivalent; upper-division standing.

Teaches how forecasts are developed and utilized. Emphasizes common forecasting methods used in business and uses specific cases to illustrate these methods. Applications to business include forecasting sales, production, inventory, macroeconomic factors such as interest and exchange rates, and other aspects of both short- and long-term business planning.

**BUS 127. Introduction to Quality Improvements (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 048 or STAT 100A or consent of instructor. Explores Deming's 14 points for management, graphical methods, fishbone diagram, Pareto analysis, control charts for attributes and variables, cusum and moving average charts, process-capability, economic design, acceptance sampling, Taguchi method, parameter design, tolerance design, reliability, hazard rate, censoring, and accelerated life testing. Cross-listed with STAT 127.

**BUS 128. Project Planning and Control (4)** Lecture, 3 hours; assigned problems and field project, 3 hours. Prerequisite(s): BUS 104/STAT 104. Covers issues related to planning and control. Topics include differences between projects and production systems, breakdown structures of project organization and work, sequencing and budgeting, resource management, project evaluation and control, and use of current project management software. Students apply this methodology to a real-world project.

**BUS 129. Supply Chain Management (4)** Lecture, 3 hours; assigned problems, 3 hours. Prerequisite(s): BUS 105. Focuses on management of the distribution of goods and services from plants, ports, and vendors to customers. Key topics include transportation, inventories, warehousing, materials handling, order processing, packaging, pricing, customer service standards, and warehouse and retail location.

**BUS 130. Supply Chain Modeling (4)** Lecture, 3 hours; homework problems and preparation for presentations, 3 hours. Prerequisite(s): BUS 104/STAT 104 or BUS 105. Covers the modeling and analysis of decision problems in supply chain management. Includes logistics network design, integration of supply chain operations, and supply and sourcing decisions. Utilizes the electronic spreadsheet as the principal device for building models, as well as addresses the concepts of effective spreadsheet design and use.

**BUS 131. Fixed-Income Securities (4)** Lecture, 3 hours; extra reading, 2 hours; outside research, 1 hour. Prerequisite(s): BUS 106/ECON 134; ECON 101 or STAT 048. Covers fixed-income securities and basic analytical tools in fixed-income markets. Topics include relative pricing of fixed-income securities, yield-curve estimation, securities with embedded options, and trading strategies. Utilizes instruments such as interest rate swaps, mortgage-backed securities, and credit derivatives.

**BUS 134. Corporate Finance (4)** Lecture, 3 hours; extra reading, 1 hour; term paper, 2 hours. Prerequisite(s): BUS 106/ECON 134. Explores capital budgeting under uncertainty, cost of capital, capital structure, and basics of corporate governance. May cover other related topics. Provides an understanding of the theoretical issues related to these topics. Emphasizes formulating optimal financial decisions. May include case-method teaching and data analysis.

**BUS 135. Corporate Financial Policy (4)** Lecture, 3 hours; extra reading, 1 hour; term paper, 2 hours. Prerequisite(s): BUS 106/ECON 134. Covers application of option pricing in corporate finance, financial planning, working capital management, mergers and acquisitions, and risk management. May cover other related topics. Emphasizes formulating optimal financial decisions. May include case-method teaching and data analysis.

**BUS 136. Investments: Security Analysis and Portfolio Management (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 106/ECON 134. Provides a thorough study of the investment process. Topics include portfolio selection, asset-pricing models, term structure, and portfolio performance valuation. Discusses empirical uses of securities data and empirical issues in testing asset pricing models.

**BUS 137. Investments: Derivatives Markets (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 106/ECON 134. Covers option market characteristics, option pricing theories, and speculative strategies used in local, national, and international markets. Analyzes other derivatives instruments including futures, forwards and swaps. Discusses empirical uses of securities data related to derivatives markets.

**BUS 138. International Finance (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 106/ECON 134 or equivalent; upper-division standing. A survey of international financial institutions and the financial factors that affect the modern multinational corporation. Covers trade and international investment theories and empirical analysis. Topics include the international financial systems, balance of payments, foreign exchange markets, measurement of foreign exchange risk, hedging, international asset pricing, and trade financing.

**BUS 139. Real Estate Investments (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 106/ECON 134. Analysis of real estate development including consideration of site selection, market analysis, financing, design and construction, loan contracts, mortgage risks, and investment analysis.

**BUS 140 (E-Z). Current Topics in Finance (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): BUS 106/ECON 134. Addresses contemporary issues in finance. Includes financial markets, private equity, asset pricing, performance evaluation, derivative securities, market micro structure, corporate finance, corporate control and governance, and the global economy. Explores recent developments in theoretical, empirical, and applied finance. Also addresses the regulatory and ethical environment of finance. Each segment is repeatable as its topics change to a maximum of 8 units. .

**BUS 143. Judgment and Decision Making (4)** Lecture, 3 hours; written work and group presentation, 3 hours. Prerequisite(s): senior standing. Covers decision making, including thinking and judgments; information selection and evaluation; learning and memory; the social side of judgment and decision making; fairness, moral obligations, and social dilemmas; and decision making in organizations.

**BUS 144. Negotiation Fundamentals (4)** Lecture, 3 hours; outside projects, 3 hours. Prerequisite(s): senior standing. Develops an understanding of the theory and processes underlying a broad spectrum of negotiation problems. Students attain competency in negotiations by applying analytic and interpersonal skills covered in readings and lecture to regular exercises and debriefings.

**BUS 145. Conflict and Cooperation in Groups (4)** Lecture, 3 hours; assigned problems, 3 hours. Prerequisite(s): STAT 048 or STAT 100A; senior standing. A general survey of the major concepts and techniques of game theory. Illustrates the basic concepts of games in extensive and strategic form. Also addresses the solution concept of the Nash equilibrium for non-cooperative games with major findings of

experimental research. Reviews selected applications in business and economics.

**BUS 146. Introduction to Entrepreneurship (4)** Lecture, 30 hours per quarter; outside research, 30 hours per quarter. Prerequisite(s): BUS 106/ECON134; upper-division standing. Discusses the nature of entrepreneurship and its role in the economy. Topics include identifying and evaluating business opportunities, creating a team, and acquiring financial and other necessary resources.

**BUS 147. Entrepreneurial Finance (4)** Lecture, 30 hours per quarter; outside research, 30 hours per quarter. Prerequisite(s): BUS 106/ECON 134. Focuses on the financing of entrepreneurial ventures. Provides an understanding of opportunity recognition skills, funding techniques, and institutions involved in the financing of new ventures. Includes financial modeling, cash needs assessment, valuation, deal structure, financing alternatives, simulation, and harvesting.

**BUS 148. Business Plan Development (4)** Lecture, 30 hours per quarter; outside research, 30 hours per quarter. Prerequisite(s): BUS 146. Covers the process of developing a business plan. Provides students with skills necessary to assess new venture opportunities and convert them into businesses.

**BUS 153. Labor Economics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. An analysis of labor demand, labor supply, and the structure of wages. Emphasizes neoclassical, institutional, and radical perspectives. Cross-listed with ECON 153.

**BUS 154A. Business Law (4)** Lecture, 3 hours; extra reading and project, 3 hours. Prerequisite(s): upper-division standing. Studies law as an integral part of the business environment, a process derived from and changing with the larger society. Areas covered include contracts, torts, agency, partnerships, corporations, and bankruptcy.

**BUS 154B. International Business Law (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): BUS 154A. Examines major treaties, conventions, and customary laws which affect business transactions among international businesses. Areas covered include international contracting, transportation, payment, legal systems, intellectual property, tariff computation, business organizations, litigation, and General Agreement on Tariffs and Trade (GATT).

**BUS 155. Managing Human Resources (4)** Lecture, 3 hours; extra reading and project, 3 hours. Prerequisite(s): BUS 107; upper-division standing. Applies a strategic planning approach to managing relations between an organization and its human resources. Topics include processes of forecasting and job analysis, environmental scanning, recruitment and selection, evaluation and compensation, and dispute resolution.

**BUS 156. Leadership Development (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): BUS 107; upper-division standing. Analyzes leadership theory and practice through lectures, self-analysis instruments, and discussions of independent field experiences. Surveys areas pertaining to leadership, such as leadership theory, leadership style, oral and written communication, ethical leadership, interpersonal conflict management, and the dynamics of culture, and gender in organization leadership.

**BUS 157. Managing Work Force Diversity (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing. BUS 155 or PSYC 142 is recommended. Covers management issues triggered by the increasing participation of women and minorities in the work force. Topics include work role stereotyping,

workplace representation and segregation, culturally based leadership and communication styles, work-family conflicts, and related legislative initiatives.

**BUS 158. Organizations as Cultural Systems (4)** Lecture, 6 hours; extra reading and written exercises, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the role of culture in the formation and management of complex bureaucratic organizations. Covers types of organizations and organizational cultures, the impact of the cultural environment, and problems posed by rapid cultural change. Offered in summer only. Cross-listed with ANTH 105.

**BUS 159. Accounting for Nonprofit Entities (4)** Lecture, 3 hours; case problems, 3 hours. Prerequisite(s): BUS 021. Introduces basic principles of accounting for nonprofit institutions. Focuses on accounting for state and local governments, hospitals, schools, nonprofit health and welfare organizations, and colleges and universities.

**BUS 160. Industrial Organization (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B. A study of the organization and structure of the American industrial system. Emphasizes production and pricing behavior and policies. Also addresses market structure and public policies regulating or influencing market behavior. Cross-listed with ECON 160.

**BUS 161. Forensic and Fraud Auditing (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 165B. An introduction to forensic accounting and fraud examination and how they pertain to both civil and criminal matters. Covers the characteristics of fraud, fraud prevention and detection, investigative techniques, asset recovery, and the use of information technology.

**BUS 162. Managerial Economics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 102 or ECON 104A. Examines applications of economic analysis to problems of management, especially of capital. Emphasis is on production economics and cost analysis. Cross-listed with ECON 162.

**BUS 165A. Intermediate Financial Accounting (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 021 or equivalent. In-depth study of financial accounting theory and practice. Develops an understanding of accounting concepts and generally accepted accounting principles and the ability to apply this technical knowledge to solve accounting problems. Topics include principal financial statements and accounting and valuation of various assets.

**BUS 165B. Intermediate Financial Accounting (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 165A or equivalent. Continuation of study of financial accounting theory and practice. Topics include current liabilities and contingencies, long-term liabilities, contributed capital, retained earnings, and temporary and long-term investments.

**BUS 165C. Intermediate Financial Accounting (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 165B or equivalent. Continuation of study of financial accounting theory and practice. Covers the conceptual discussion and procedural presentation of financial accounting topics as well as recent developments in accounting valuation and reporting practices promulgated by practitioners in industry and public accountants.

**BUS 166. Accounting Information Systems (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 101, BUS 108, or equivalents. Study of the concepts and techniques in the design

and implementation of accounting information systems within companies' operating environments. Emphasis is on the effects of the computer on these systems.

**BUS 167. Advanced Financial Accounting (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 165C (may be taken concurrently). Covers advanced accounting topics such as consolidated financial statements, accounting for multinational corporations, partnership accounting, and accounting for nonprofit organizations.

**BUS 168A. Individual Taxation (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 108 or equivalent. Concentrates primarily on the basic provisions of the federal income taxes imposed on individuals and the accounting for those taxes. While the major emphasis is on current tax provisions and tax planning, consideration is also given to the legislative and judicial development of these provisions.

**BUS 168B. Federal Taxation for Corporations, Partnerships, Estates, and Trusts (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 168A. Covers tax research, corporate taxation, partnership taxation, the wealth transfer taxes, income taxation of estates and trusts, international taxation, and tax administration.

**BUS 169A. Auditing (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 165B. Covers the auditing environment, the auditor's legal liability, audit responsibilities and objectives, audit evidence, audit planning and documentation, the auditor's report, and management letters.

**BUS 169B. Quality Assurance in Auditing (4)** Lecture, 3 hours; case analyses, 3 hours. Prerequisite(s): BUS 169A. Covers the audit process (internal control, compliance tests, sampling, substantive evidence gathering, electronic data processing auditing) and the audit procedures for various types of accounts such as sales, cash, accounts receivable, payroll, inventory, and capital acquisitions.

**BUS 171. Systems Analysis and Design (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 101 or equivalent. Involves detailed analysis, specification, design, and implementation of computer-based information systems. Includes economic analyses, evaluation of alternatives, analysis or design tools, and systems project management and planning. Case studies are used.

**BUS 172. Information Economics (4)** Lecture, 3 hours; assigned cases and project, 3 hours. Prerequisite(s): BUS 103; ECON 004 or equivalent. Discusses economic concepts and strategies related to the network economy. Topics include economic issues surrounding information goods, competition in electronic business, pricing strategies, and intellectual property protections. Examines business strategies for the information (software) and infrastructure (hardware) elements of electronic business.

**BUS 173. Introduction to Databases for Management (4)** Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 101 or equivalent. Covers physical and conceptual aspects of database management systems, including familiarity with the variety of database systems based on different data models. Examines the role of database systems in management information systems (MIS) and issues in database design for effective support of MIS. Requires the use of a database package.

**BUS 174. Electronic Commerce (4)** Lecture, 3 hours; extra reading, 2 hours; project, 1 hour. Prerequisite(s): BUS 101. Reviews the technological evolution of electronic commerce (EC). Investigates how EC can be

used to interact with customers, other organizations, and those within the organization. Studies technical innovations, provides a critical evaluation of strategies, and examines current applications and their impact on the business environment.

**BUS 175. Business Data Communications (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): BUS 101. Surveys components of telecommunication systems; examines major design and analysis issues in the development and implementation of computer communication systems. Studies both voice and data communication systems including local area networks, wireless systems, satellite systems, and distributed computer and database systems. Emphasizes evaluation of these systems for business purposes.

**BUS 176. The Sociology of Work in Organizations (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. Emphasizes the roles of individuals in organizations. Topics include the effects of jobs on workers, long-term trends in the nature of work, and differences in work among major segments of the labor force. Cross-listed with SOC 176.

**BUS 177. Strategies in Information Systems (4)** Lecture, 3 hours; project, 3 hours. Prerequisite(s): BUS 101. Reviews techniques and methodologies for strategic planning and management. Explores how corporate or strategic planning must be revised for and adapted to the new global telecommunications environment. Topics include time-based management, forecasting and modeling, and construction of a detailed storage plan. Uses detailed case studies.

**BUS 178. International Trade (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A study of the pure theory of trade, trade policy, and international factor movements. Includes illustrative applications to current issues and problems. Cross-listed with ECON 178.

**BUS 185. International Strategy and Management (4)** Lecture, 3 hours; outside project, 3 hours. Prerequisite(s): senior standing; BUS 109 is recommended. Examines the management and strategic challenges of firms competing in international and global markets. Topics include recent trends in globalization of markets and industries, strategic alliances, foreign direct investment, emerging economies, political risk and cross-cultural interaction, and leadership.

**BUS 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing; consent of instructor and program chair. A project to be undertaken under faculty supervision. Course is repeatable to a maximum of 12 units.

**BUS 198-I. Individual Internship in Business Administration (1-12)** Seminar, 1 hour; internship, 3-36 hours; term paper, 1-11 hours. Prerequisite(s): upper-division standing in Business Administration; consent of instructor. Active participation in the work of a business concern or a public or quasi-public agency combining academic instruction and supervised field experience. A maximum of 4 quarter units may be counted toward the degree requirements for Business Administration. Course is repeatable to a maximum of 16 units.

**BUS 199H. Senior Honors Research (1-5)** Seminar, 1 hour; extra reading, 2-12 hours; term paper, 2-12 hours. Prerequisite(s): senior standing with a major in Business Administration; admission to the University Honors Program or consent of instructor. Involves research in business administration under faculty supervision. Students submit a written report. Graded In Progress (IP) until the last quarter is completed, at

which time a final grade is awarded. Course is repeatable to a maximum of 12 units.

# Cell Biology and Neuroscience

**Subject abbreviation: CBNS**  
**College of Natural and Agricultural Sciences**

David A. Eastmond, Ph.D., Chair  
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David A. Eastmond, Ph.D.  
Sarjeet S. Gill, Ph.D.  
Manuela Martins-Green, Ph.D.  
Frances M. Sladek, Ph.D.  
B. Glenn Stanley, Ph.D. (Cell Biology and Neuroscience/Psychology)  
Prudence Talbot, Ph.D.  
Raphael Zidovetzki, Ph.D.

## Professors Emeriti

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Nancy E. Beckage, Ph.D. (Cell Biology and Neuroscience/Entomology)  
Paul D. Wilson, Ph.D. (Cell Biology and Neuroscience/Psychology)

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Maksim Bazhenov, Ph.D.  
Margarita C. Currás-Collazo, Ph.D.  
Scott N. Currie, Ph.D.  
Karine G. Le Roch, Ph.D.  
Constance I. Nugent, Ph.D.

## Assistant Professors

Todd Fiacco, Ph.D.  
Nicole zur Nieden, Ph.D.  
\* \*

## Adjunct Associate Professors

André Obenaus, Ph.D.  
Yanhong Shi, Ph.D.

Research in the Department of Cell Biology and Neuroscience uses multidisciplinary approaches to understanding basic cellular processes in various tissues, including the nervous system, as well as more integrative levels of analysis, including behavior. Areas of research represented in the department include the following:

- Biophysical properties of excitable membranes
- DNA repair
- Transcriptional regulation
- Mechanisms of toxicity
- Insect development
- Membrane transport
- Mechanisms of mitotic chromosome transmission
- Telomere maintenance
- Synaptic structure and function
- Changes in nervous system with experience
- Interactions of nervous and endocrine systems

- Reproductive biology and fertilization
- Chemokine function in wound healing and tumor development
- Glia-neuron signaling and sensory and motor integrative processes

## Undergraduate Curriculum

Students interested in cell, molecular, and developmental biology can obtain training through the interdepartmental major in Cell, Molecular, and Developmental Biology leading to the B.S. degree. Students interested in neuroscience can obtain training in behavioral neuroscience, neurobiology, and neurochemistry through the Neuroscience major leading to the B.A. or B.S. degree. The Neuroscience major is an intercollege major offered by the College of Humanities, Arts, and Social Sciences and the College of Natural and Agricultural Sciences. See Biological Sciences section and Neuroscience Undergraduate Major section, respectively.

## Graduate Curriculum

Courses and research opportunities are offered by the interdepartmental graduate programs in Cell, Molecular, and Developmental Biology; Environmental Toxicology; and Neuroscience. See the respective graduate program section.

## Lower-Division Course

### CBNS 004. Concepts in Medical Cell Biology (3)

Lecture, 1 hour; workshop, 4 hours. Prerequisite(s): CHEM 001A or CHEM 01HA (may be taken concurrently). Introduces fundamental concepts in molecular cell biology, with emphasis on human health and disease. Modules involve lectures and interactive, problem-oriented discussions with faculty. Through classical and contemporary examples, modules acquaint students with the scientific process and how it leads to insights into human biology. Credit is not awarded for CBNS 004 if it has already been awarded for BIOL 005A.

## Upper-Division Courses

**CBNS 101. Fundamentals of Cell Biology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 112C; BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently). Introduces the principles of eukaryotic cell biology. Includes an examination of the molecules and systems that mediate cell function and an overview of membrane architecture and function, cell signaling and signal transduction, the cytoskeleton, organelles, protein targeting and secretion, and the nucleus and nuclear transport. Credit is not awarded for CBNS 101 if it has already been awarded for BIOL 113 or BIOL 114.

**CBNS 106. Introduction to Neuroscience (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A and BIOL 005B with grades of "C-" or better, CHEM 001A, CHEM 001B, CHEM 001C; or consent of instructor. An introduction to cellular, organismal, and behavioral neuroscience for science majors. Topics include structure and functions of the brain, neurons, and synapses; sensory systems and perception; control of movement; neurobiology of hormones and sex-

ual behavior; biorhythms, learning, memory, and psychoses. **Fiacco, Korzus, Stanley**

**CBNS 108. Introduction to Developmental Biology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102, CHEM 112C; or consent of instructor. Emphasizes common principles and key concepts that govern development of multiple eukaryotic systems, and how genes control cell behavior during development.

**CBNS 116. Human Neuroanatomy: Structure-Function Relationships (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of "C-" or better or consent of instructor. Provides in-depth study of human functional neuroanatomy including gross anatomy of the brain and spinal cord, microscopic anatomy (histology) of cellular components, and fine structure of the nervous system at the electron microscope (EM) level. Emphasizes understanding the neuroanatomy of key structures (e.g., hypothalamus, brainstem, hippocampus). **Fiacco**

**CBNS 120. Cellular Neuroscience: Membrane and Synaptic Phenomena (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. An examination of cellular and molecular mechanisms of nervous system function using concepts drawn from the study of vertebrates and invertebrates with emphasis on mammalian systems. Cross-listed with PSYC 120.

**CBNS 120L. Neuroscience Laboratory (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CBNS 120/PSYC 120 or concurrent enrollment. Laboratory experiments using electrophysiological, chemical, and anatomical research methods fundamental to understanding neurons and neural systems. Cross-listed with PSYC 120L. **Adams, Currie, Stanley**

**CBNS 121. Developmental Neuroscience (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. A study of the development of nervous systems. Examines the cellular and molecular mechanisms of neural development and the determinants of cell birth and death, axonal pathfinding, neuronal connections, and development of neural systems underlying behavior. Cross-listed with PSYC 121.

**CBNS 124. Systems Neuroscience (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of "C-" or better or consent of instructor. A study of the structure and function of motor and sensory systems in vertebrate and invertebrate nervous systems. Cross-listed with PSYC 124.

**CBNS 125. Neuropharmacology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 120/PSYC 120; previous or concurrent enrollment in CBNS 120L/PSYC 120L and CBNS 124/PSYC 124 recommended. Examines synaptic neurotransmitter systems, mechanisms, and pharmacological agents and effects, which are fundamental to neural information processing. Cross-listed with PSYC 125.

**CBNS 126. Neuroscience of Learning and Memory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or PSYC 110 or consent of instructor. Covers mechanisms of learning and memory across levels of analysis, including genetic, neuronal, systems and theory. Topics include the multiple memory systems, memory consolidation, working memory, emotional memory, recognition memory, spatial memory, and human amnesia. Cross-listed with PSYC 126.

**CBNS 127. Behavioral Control Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 120/PSYC 120; CBNS 124/PSYC 124 strongly recommended. An analysis of the principles of nervous system operation from the processing of sensory inputs for object recognition and localization to the organiza-

tion of central patterns for generation of sequenced motor output. Cross-listed with PSYC 127. **Currie**

**CBNS 128. Immunology (3)** Lecture, 3 hours. Prerequisite(s): BIOL 005C; PHYS 002C; PHYS 02LC; BCH 100 or BCH 110A. A study of humoral and cellular immunology. Topics include lymphoid systems, cells, antigens, antibodies, antibody formation, cellular immunity, and tumor and transplantation immunology. Diseases and altered immune states associated with each topic are discussed in detail. Cross-listed with BIOL 128.

**CBNS 129. Brain Control of Bodily Functions (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 124/PSYC 124 with a grade of "C-" or better or consent of instructor. Emphasizes principles of organization and function related to endocrine and other physiological systems. Selected topics include control of breathing, body water, temperature, cardiovascular function, and the stress response.

**CBNS 130L. Computational Neuroscience Laboratory: Introduction to Brain Modeling Techniques (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CBNS120/PSYC 120 or consent of instructor. Introduces computer modeling techniques used to study neurons and neural systems. Selected topics include biophysical models of single neurons, small neural circuits, synaptic interactions, and larger scale network models. **Bazhenov**

**CBNS 135. Educational Outreach Training in Neuroscience (4) W** Lecture, 10 hours per quarter; discussion, 10 hours per quarter; practicum, 20 hours per quarter; activity, 20 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): CBNS 120/PSYC 120 and CBNS 124/PSYC 124 with grades of "C" or better and upper division standing in Neuroscience. Introduction to multiple approaches and activities that can be used when teaching neuroscience concepts. Builds proficiency in organizational and presentation skills, as well as provides opportunities for educational outreach. Topics include components of oral presentation, models of teaching and learning styles, and published successes in neuroscience outreach. Satisfactory (S) or No Credit (NC) grading is not available.

**CBNS 150. Cancer Biology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; CBNS 101 is recommended (may be taken concurrently). The origin, development, and treatment of cancer are explored with emphasis on molecular mechanisms. Topics such as oncogenes, tumor suppressors, cell cycle and differentiation, AIDS, and hereditary and environmental factors in the development of cancer are covered. Cross-listed with ENTX 150.

**CBNS 165. Stem Cell Biology (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 101 or consent of instructor. An introduction to various stem cells, their characteristics, and their niches. Explores the molecular concepts of stem cell self-renewal and tissue and organ development. Illustrates their application in therapies and explains routine methods used in stem cell biology. Reviews current governmental regulations and ethics. **zur Nieden**

**CBNS 169. Human Embryology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C or consent of instructor. An in-depth study of normal human development from conception through the early postnatal period. Demonstrations use microscopic and other materials specifically adapted for the course. Some consideration is given to abnormal development.

**CBNS 190. Special Studies (1-4)** Individual study, 3-12 hours. Prerequisite(s): upper-division standing;

consent of instructor and department chair. Individual study to meet special curricular needs. Grading basis to be determined in consultation with the instructor and department chair. Course is repeatable to a maximum of 12 units.

**CBNS 194. Independent Reading (1-2)** Individual study, 3-6 hours. Prerequisite(s): consent of instructor. Individual reading under faculty direction. Course is repeatable to a maximum of 4 units.

**CBNS 197. Research for Undergraduates (1-4)** Outside research, 3-12 hours. Prerequisite(s): either sophomore standing and one course in Cell Biology and Neuroscience or upper-division standing; consent of instructor. An introduction to laboratory research conducted under faculty supervision. Students who submit a written report or give an oral presentation receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CBNS 198-I. Individual Internship (1-12) F, W, S, Summer** Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): consent of instructor. Explores career development within the context of cell, molecular, and developmental biology or health sciences. Includes supervision by an off-campus sponsor and an on-campus faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**CBNS 199. Senior Research (1-4)** Outside research, 3-12 hours. Prerequisite(s): senior standing; consent of instructor. Original research undertaken under the direction of a faculty member. Students who submit a written report or give an oral presentation receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

# Cell, Molecular, and Developmental Biology

**Subject abbreviation: CMDB**

**College of Natural and Agricultural Sciences**

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Xuan Liu, Ph.D. (Biochemistry)  
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Laura Zanello, Ph.D. (Biochemistry)  
Nicole zur Nieden, Ph.D. (Cell Biology and Neuroscience)

## Major

The Cell, Molecular and Developmental Biology major is designed to prepare students for diverse and exciting careers that include research, professional programs in the health sciences, and biotechnology. Course work is structured so that students first receive a solid grounding in the basic genetic and biological principles. Subsequent course requirements expand upon these themes and include courses in cell biology, molecular biology, developmental biology and genetics. Problem-based learning is employed throughout the curriculum to produce graduates with the analytical and critical thinking skills necessary to become successful researchers and professionals. After completing required core courses, students take intermediate level courses that lay the foundation for more advanced undergraduate courses. Several mechanisms exist to tailor the curriculum to the needs of the individual student, including by choosing either Disciplinary or Health Science track options.

Both the Disciplinary and Health Science tracks can lead to B.A. or B.S. degrees. They have similar major requirements, but the B.A. degree requires 12 additional units of Humanities and Social Sciences courses and 16 units in a foreign language (see College Breadth Requirements).

## University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

## College Requirements

See Degree Requirements, College of Natural and Agricultural Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

## Major Requirements

Some of the following requirements for the Cell, Molecular and Developmental Biology major may also fulfill the College's breadth requirements. Consult with an advisor for course planning.

1. Life Sciences core curriculum (72-76 units)
  - a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC

- c) CHEM 112A, CHEM 112B, CHEM112C  
 d) PHYS 002A, PHYS 002B, PHYS 02LA, PHYS 02LB, PHYS 002C, PHYS 02LC  
 e) MATH 009A, MATH 009B  
 f) STAT 100A  
 g) BCH 100, or BCH 110A and BCH 110B

2. Upper-division requirements (48 units)

- a) Major core (16 units) BIOL 102, BIOL 107A, CBNS 101, CBNS 108.  
 b) Major electives (32 units from the following).

**Cellular emphasis.** At least one of the following is required: BIOL 113; BIOL 114; BIOL 121/MCBL 121, BIOL 128/CBNS 128; BPSC 135; CBNS 116; CBNS 120/PSYC 120.

**Molecular emphasis.** At least one of the following is required: BCH 180A; BCH 180B; BIOL 107B; BIOL 119; BIOL 124/MCBL 124; BIOL 155/BPSC 155; CBNS 150/ENTX 150.

**Developmental emphasis.** At least one of the following is required: BIOL 132/BPSC 132; BIOL 138/BPSC 138; BIOL 168; CBNS 121/PSYC 121; CBNS 169.

**Laboratory course:** Two courses in a biological science are required. Courses including at least 3 hours of lab per week are eligible, including combined lecture and lab classes. Eligible classes include BCH 102; BCH 153/BIOL 153/ BPSC 153; BIOL 121L/MCBL 121L; BIOL 132/ BPSC 132 or BIOL 138/BPSC 138; CBNS 120/ PSYC 120; and others. Students in the Health Science Track may substitute one laboratory course with a course in ethics.

**Note** A maximum of 8 units of 190-199 courses, including no more than 4 units of 198 courses, may be counted towards this requirement.

3. *Depth requirement (16 units).* For B.A. students, this requirement can be fulfilled with additional courses in Humanities and Social Sciences, and Foreign Languages. For the B.S. degree, students are required to take an additional 16 units of course work in natural sciences (including a biological or chemical science) or mathematics. Additional major elective units beyond the 24 required in 2b may be applied to this requirement.
4. *Health Science track.* Students wishing to apply to medical, dental or veterinary professional schools must follow the requirements listed above, but are encouraged to select from the following courses. For B.A. students, some of these will fulfill their Humanities and Social Sciences and Foreign Languages requirements. Please consult the faculty adviser.
- Foreign language: three courses are recommended.
  - Community service: a maximum of 4 units may be counted towards the 180 unit graduation requirement, using CBNS 198-I or equivalent.

iii. Ethics: A course is strongly recommended, such as PHIL 009 or PHIL 167.

iv. Two upper-division classes in Psychology are recommended, such as CBNS 126/PSYC 126; CBNS 127/PSYC 127; PSYC 129; PSYC 178; or PSYC 179.

v. When selecting electives in the natural sciences, students are recommended to include classes in an area of microbiology (e.g. BIOL 157, BIOL 171, ENSC 133/MCBL 133/SWSC 133, ENSC 141/MCBL 141/ SWSC 141, BIOL 121/MCBL 121, BIOL 123/ MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 134/PLPA 134), and in anatomy, zoology, or physiology (BIOL 151, BIOL 161A, BIOL 175, BIOL 176).

## Sample Program Outlines

### 1. Bachelor of Science Degree (Disciplinary track)

The sample program for B.S. students provides a solid science background for students interested in research or teaching careers in biomedical science. Undergraduate laboratory research is strongly recommended as an important element in the program.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
English 001A, 001B	4		4
CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
Biol 005A, 05LA, 005B		5	4
MATH 009A, 009B	4	4	
<b>Total Units</b>	<b>15</b>	<b>14</b>	<b>13</b>

Sophomore Year	Fall	Winter	Spring
ENGL 001C		4	
PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5
BIOL 005C, 102	4		4
CHEM 112A, 112B, 112C	4	4	4
Human/Soc. Sci Elect.	2	4	4
<b>Total Units</b>	<b>15</b>	<b>17</b>	<b>17</b>

Junior Year	Fall	Winter	Spring
BIOL 107A		4	
CBNS 101			4
STAT 100A	5		
BCH 100	4		
Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	8	8	8
Human/Soc. Sci Elect.		4	4
<b>Total Units</b>	<b>17</b>	<b>16</b>	<b>16</b>

Senior Year	Fall	Winter	Spring
CBNS 108		4	4
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSYC 120; CBNS 169)	8	4	8
Human/Soc. Sci Elect.	4	4	4
XXX 190, 197, 198, 199	2	3	3
<b>Total Units</b>	<b>14</b>	<b>15</b>	<b>19</b>

### 2. Bachelor of Science Degree (Health Science track)

The sample program for B.S. students with a professional emphasis provides a very strong science background, with recommended elective course choices emphasizing biomedical pertinence. Additionally, a for-

ign language is recommended, as well as Community Service (for course credit). Further breadth may be developed by electing Humanities and Social Science course options within the major depth requirement.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
English 001A, 001B	4		4
CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
Biol 005A, 05LA, 005B		5	4
MATH 009A, 009B	4	4	
<b>Total Units</b>	<b>15</b>	<b>14</b>	<b>13</b>

Sophomore Year	Fall	Winter	Spring
ENGL 001C		4	
PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5
BIOL 005C, 102	4		4
CHEM 112A, 112B, 112C	4	4	4
Human/Soc. Sci Elect.	2	4	4
<b>Total Units</b>	<b>15</b>	<b>17</b>	<b>17</b>

Junior Year	Fall	Winter	Spring
BIOL 107A		4	
CBNS 101			4
BCH 100	4		
Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	8	8	8
Foreign Language	4	4	4
<b>Total Units</b>	<b>16</b>	<b>16</b>	<b>16</b>

Senior Year	Fall	Winter	Spring
CBNS 108		4	
STAT 100A	5		
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSYC 120; CBNS 169)	8	4	8
Human/Soc. Sci Elect.		4	4
Foreign Language	4		
XXX 190, 197, 198, 199	2	3	3
<b>Total Units</b>	<b>19</b>	<b>15</b>	<b>15</b>

### 3. Bachelor of Arts Degree (Disciplinary or Health Science tracks)

The sample program for B.A. students provides a broad-based education that builds on the strong foundation in science, with emphasis in humanities, social sciences, and foreign language.

Freshman Year	Fall	Winter	Spring
NASC 093	2		
English 001A, 001B	4		4
CHEM 001A, 001B, 001C, 01LA, 01B, 01C	5	5	5
Biol 005A, 05LA, 005B		5	4
MATH 009A, 009B	4	4	
<b>Total Units</b>	<b>15</b>	<b>14</b>	<b>13</b>

Sophomore Year	Fall	Winter	Spring
ENGL 001C		4	
PHYS 002A, 002B, 002C, 02LA, 02LB, 02LC	5	5	5
BIOL 005C, 102	4		4
CHEM 112A, 112B, 112C	4	4	4
Foreign Language			4
Human/Soc. Sci Elect.	4	4	
<b>Total Units</b>	<b>17</b>	<b>17</b>	<b>17</b>

Junior Year	Fall	Winter	Spring
BIOL 107A		4	
CBNS 101			4
BCH 100	4		
Major Elect. & Depth reqs (e.g. BIOL 121/MCBL 121, 121L; BIOL 107B, BIOL 128/CBNS 128)	4	4	4
Human/Soc. Sci Elect.			

(e.g. PSYC 002, 178, 179, PHIL 167)	4	4	8
Foreign Language	4	4	
<b>Total Units</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Senior Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
CBNS 108		4	
Major Elect. & Depth reqs (e.g. BIOL 113, 168; BIOL 132/BPSC 132; BPSC 135; CBNS 120/PSCYC 120; CBNS 169)	8	4	8
STAT 100A		5	
Human/Soc. Sci Elect.	4	4	8
XXX 190, 197, 198, 199	2	3	
<b>Total Units</b>	<b>14</b>	<b>18</b>	<b>16</b>

## Graduate Program

The Cell, Molecular, and Developmental Biology Graduate Program is an interdepartmental program offering M.S. and Ph.D. degrees to students seeking advanced training in these disciplines. The program focuses on the bridge between basic and applied research and on the interface between cell, molecular, and developmental biology. Participating faculty are drawn from numerous biological sciences departments whose research interests in cell, molecular, and developmental biology span biomedical to agricultural problems, and students in the program benefit from unique training opportunities.

Students seeking admission into the program should meet all general requirements of the Graduate Division as printed in the Graduate Studies section of this catalog.

The Cell, Molecular, and Developmental Biology program offers the M.S. and Ph.D. degrees in Cell, Molecular, and Developmental Biology.

**Admission** Applicants should have adequate undergraduate course work in chemistry (two years), physics (one year), calculus (one year), statistics (one course), biochemistry (one course), and biology (two years, including a course in genetics and two courses among cell, molecular, or developmental biology). Applicants with strong academic records but with deficiencies in preparation for graduate training may be admitted and must rectify undergraduate deficiencies early in the first two years of residence. Applicants must submit GRE General Test scores (verbal, quantitative and analytical).

**Course Work** All students must complete the following core of course work:

1. One graduate-level course in cell biology (BIOL 200/CMDB 200, BPSC 237, or NRSC 200A/PSYC 200A)
2. One graduate-level course in molecular biology (BIOL 201/CMDB 201, BCH 211, BPSC 231/BCH 231, BMSC 202, or NRSC 200B/PSYC 200B)
3. One graduate-level course in developmental biology (BPSC 232, CMDB 202)

Each student must enroll in the program seminars (CMDB 257, CMDB 258) each time they are offered. Upon entry into the program, each

student meets with a guidance committee, which recommends a course of study commensurate with the student's interests and background.

## Master's Degree

The Cell, Molecular, and Developmental Biology program offers an M.S. degree.

**Plan I (Thesis)** Students complete the course work above, enroll in one graduate seminar course in cell, molecular, or developmental biology (BCH 230(EZ), BIOL 281(E-Z)/CMDB 281(E-Z), BPSC 240, BCH 289/BIOL 289/NRSC 289/PSYC 289), and undertake a research project leading to a thesis.

Each student must complete 36 units of course work, of which at least 24 units must be in the graduate series (200 level) in the biological sciences. No more than 12 units in courses numbered 290-299 may be taken to fulfill the 24-unit requirement. Candidates for the M.S. degree must defend their thesis at a public oral presentation.

**Normative Time to Degree** Two years

## Doctoral Degree

The Cell, Molecular, and Developmental Biology program offers a Ph.D. degree.

### Degree Requirements

1. Completion of the course work listed above
2. One additional graduate course in cell, molecular, and developmental biology
3. Two graduate seminar courses in cell, molecular, or developmental biology (BCH 230 (E-Z), BIOL 281 (E-Z)/CMDB 281 (E-Z), BPSC 240, BCH 289/BIOL 289/ CHEM 289/ENTM 289/NRSC 289/PSYC 289)
4. A research project leading to a dissertation
5. Oral public defense of dissertation

### Written and Oral Qualifying Examinations

Doctoral students are advanced to candidacy following successful completion of written and oral qualifying examinations. Students write a proposal detailing the rationale, specific aims, and approaches to be undertaken for their proposed dissertation research prior to taking the oral qualifying examination.

**Dissertation** Candidates must successfully defend their dissertation research in a public oral presentation.

**Teaching Requirement** Students must fulfill a two-quarter teaching requirement.

## Career Opportunities

There is a high demand in industry and academia for scientists with training in cell, molecular, and developmental biology. Students matriculating from the program are well trained in this field and successfully obtain positions in biotechnology, including biomedical and agricultural industries, and at colleges and universities nationwide.

**Normative Time to Degree** Five years

## Graduate Courses

**CMDB 200. Cell Biology (4) F** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 113 or BIOL 114 or CBNS 101 or equivalent. An examination of the structure and function of eukaryotic cells and their components with emphasis on the key experiments that provide the foundation for our current knowledge. Covers topics such as cell membranes, intracellular trafficking, cell-to-cell interactions, motility, and the cytoskeleton. Cross-listed with BIOL 200.

**CMDB 201. Molecular Biology (4) W** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 107A or equivalent. Covers the structure and inheritance of genetic material, the regulation of gene expression at the cellular and molecular level including molecular mechanisms for regulation of gene transcription, posttranscriptional regulation at the level of messenger RNA stability, processing, editing and translation, methods for gene mapping, and positional cloning. Cross-listed with BIOL 201.

**CMDB 202. Developmental Biology (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 101 or equivalent. An examination of development, beginning with the principles that underlie developmental studies of all multicellular organisms. Focuses on plants, insects, and fungi but introduces other model systems. Topics are taken from the current literature.

**CMDB 204. Genome Maintenance and Stability (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 113 or BIOL 114 or CBNS 101; BIOL 102 is strongly recommended. Emphasizes chromosome-based processes that maintain genome integrity and ensure accurate genome transmission during cell division. Topics are drawn from the primary literature and include chromatin structure and composition, DNA repair and recombination, telomere function and chromosome maintenance, mitotic chromosome segregation, and checkpoint surveillance mechanisms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BCH 204 and ENTX 204.

**CMDB 205. Signal Transduction Pathways in Microbes and Plants (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in the biological sciences, BIOL 107A or BIOL 113 or BIOL 114 or CBNS 101; or consent of instructor. Advanced topics in signal transduction pathways that regulate growth and development in plants and prokaryotic and eukaryotic microbes. Areas covered include two-component regulatory systems; quorum sensing; signaling via small and heterotrimeric G proteins; mitogen-activated protein kinase cascades; cAMP signaling; photoreceptors; plant hormone signaling; responses to low-oxygen stress; calcium signaling; and plant pathogenesis. Cross-listed with BCH 205, BPSC 205, GEN 205, MCBL 205, and PLPA 205.

**CMDB 206. Gene Silencing (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate standing, BIOL 107A or CBNS 101; or consent of instructor. An in-depth coverage of mechanisms, functions, and applications of RNAi and related gene regulatory pathways guided by small RNAs such as siRNAs and miRNAs in plants and animals. Cross-listed with GEN 206 and MCBL 206.

**CMDB 207. Stem Cell Biology and Disease (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS

101 or equivalent, graduate standing; or consent of instructor. Introduces animal and human stem cell biology and the application of stem cell biology to medicine.

**CMDB 208. Bioethics (1)** Discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduces bioethics, with an emphasis on the medical and social implications of stem cell biology. **Cranor in charge**

**CMDB 210. Molecular Biology of Human Disease Vectors (3)** Lecture, 2 hours; seminar, 1 hour. Prerequisite(s): consent of instructor. Covers the molecular aspects of vectors transmitting most dangerous human diseases. Involves lectures and student presentations about current issues in molecular biology and genomics of vector insects and pathogens they transmit. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ENTM 210 and MCBL 210. **Raikhel**

**CMDB 211. Laboratory in Human Embryonic Stem Cell Culture (2)** Lecture, 5 hours per quarter; laboratory, 40 hours per quarter; workshop, 5 hours per quarter. Prerequisite(s): consent of instructor. Introduces the methods used to culture human embryonic stem cells (hESC) in vitro. Provides hands-on experience in plating, passaging, culturing, differentiating, and freezing of hESC. Additional topics include staining colonies of hESC for pluripotency markers (including alkaline phosphatase); labeling colonies using immunohistochemistry; and performing chromosome squashes for evaluation of aneuploidy. Graded Satisfactory (S) or No Credit (NC). **Talbot, zur Nieden**

**CMDB 220. Chemical Genomics Design Studio (2)** Lecture, 1 hour; practicum, 4 hours. Prerequisite(s): Course work in cell biology, genetics, combinatorial chemistry; or consent of instructor; graduate standing. Explores chemical genomic research approaches. Emphasizes critical thinking; advanced planning of time-consuming tests of hypotheses and experimental caveats, trade-offs, and options. Taught in a case-study approach, teams consist of students with engineering, biology, computational sciences, and chemical backgrounds. Teams generate an interdisciplinary chemical genomic research project. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BIEN 220. **Schultz**

**CMDB 230. Molecular Plant-Microbial Interactions (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120/MCBL 120/PLPA 120, or equivalents. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with BPSC 230, GEN 230, and PLPA 230. **Eulgem, Jin**

**CMDB 250. Special Topics in Cell, Molecular, and Developmental Biology (1-2) F, W, S** Seminar, 1-2 hours. Prerequisite(s): graduate standing. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each participant. Content emphasizes recent advances in the topic area and varies accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CMDB 255. Stem Cell Biology (1)** Discussion, 10 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Presents research data to an interdisciplinary group of stem cell biologists. Covers presentation skills and answering questions about research data. Fosters discussion of stem cell biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CMDB 256. Seminar in Stem Cell Biology (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides opportunities to meet stem cell researchers from other campuses and learn about the latest developments in animal and human stem cell research. Includes investigators who focus on the potential application of stem cells to medicine. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CMDB 257. Seminar in Cell, Molecular, and Developmental Biology (1) F, W** Seminar, 1 hour. Prerequisite(s): graduate standing. Presentations by visiting scholars, CMDB faculty, and CMDB students on current research in cell, molecular, and developmental biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 30 units.

**CMDB 258. Graduate Student Seminar in Cell, Molecular, and Developmental Biology (1) W** Seminar, 10 hours per quarter; one 1-day seminar. Prerequisite(s): graduate standing in Cell, Molecular, and Developmental Biology. An interdisciplinary seminar consisting of student presentations of original research and discussion of current research topics in cell, molecular, and developmental biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 30 units.

**CMDB 281 (E-Z). Seminar in Cell Development, Structure, and Function (2) F, W, S** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Lectures, discussions, and demonstrations by students, faculty, and invited scholars on selected subjects concerned with the principles of cell development, structure, and function. E. Cell Biology; F. Molecular Biology; G. Developmental Biology. Segments are repeatable. Cross-listed with BIOL 281 (E-Z).

**CMDB 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study, directed by a faculty member, of specially selected topics in cell, molecular, and developmental biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CMDB 292. Concurrent Analytical Studies in Cell, Molecular, and Developmental Biology (2-4)** Outside research, 6-12 hours. Prerequisite(s): graduate standing. Elected concurrently with an appropriate undergraduate course, but on an individual basis. Students are required to submit one or more graduate papers based on research or criticism related to the course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CMDB 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing. Research and experimental studies conducted under the supervision of a faculty member on specially selected topics in cell, molecular, and developmental biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CMDB 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**CMDB 301. Teaching of Cell, Molecular, and Developmental Biology at the College Level (1)** Seminar, 1 hour. Prerequisite(s): graduate standing. A

program of weekly meetings and individual formative evaluations required of new teaching assistants. Covers instructional methods and classroom/section activities most suitable for teaching Biology. Conducted by the Teaching Assistant Development Program. Graded Satisfactory (S) or No Credit (NC).

## CHASS F1RST

**Subject abbreviation: CHFY**  
**College of Humanities, Arts, and Social Sciences**

Geoff Cohen Ph.D, Academic Coordinator  
1609 Humanities and Social Sciences  
(951) 827-7831; **Chassf1rst.ucr.edu**

### Committee in Charge

Steven Brint, Ph.D. (Sociology)  
Tracy Fisher, Ph.D (Women's Studies)  
Michael Jayme, M.F.A. (Creative Writing)  
Vorris Nunly, Ph.D. (English)  
Georgia Warnke, Ph.D. (Political Science)

CHASS F1RST provides first-year students with courses designed to help with the transition to UCR, a major research university setting, which involves high academic standards and rigorous course work. The courses offer students the resources and tools necessary to excel in the first year and beyond. They take place within a "learning-communities" framework so that students can successfully integrate into campus life.

## Lower-Division Courses

**CHFY 001 (E-Z). CHASS F1RST Humanities Course (5)** Lecture, 3 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): first-year freshman standing in the College of Humanities, Arts, and Social Sciences. A College of Humanities, Arts, and Social Sciences course designed to introduce students to the humanities and to academic life. Segments of CHFY 001 (E-Z), CHFY 002 (E-Z), and/or CHFY 003 (E-Z) may be thematically and pedagogically linked.

**CHFY 002 (E-Z). CHASS F1RST Fine Arts Course (5)** Lecture, 3 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): first-year freshman standing in the College of Humanities, Arts, and Social Sciences. A College of Humanities, Arts, and Social Sciences course designed to introduce students to the fine arts and to academic life. Segments of CHFY 001 (E-Z), CHFY 002 (E-Z), and/or CHFY 003 (E-Z) may be thematically and pedagogically linked.

**CHFY 003 (E-Z). CHASS F1RST Social Science Course (5)** Lecture, 3 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): first-year freshman standing in the College of Humanities, Arts, and Social Sciences. A College of Humanities, Arts, and Social Sciences course designed to introduce students to the social sciences and to academic life. Segments of CHFY 001 (E-Z), CHFY 002 (E-Z), and/or CHFY 003 (E-Z) may be thematically and pedagogically linked.

**CHFY 007. CHASS F1RST Learning Community Workshop (1)** Workshop, 1 hour; activity, 2 hours. Prerequisite(s): first-year freshman standing in the College of Humanities, Arts, and Social Sciences. A workshop linked to a CHASS F1RST Learning

Community lecture course. Graded Satisfactory (S) or No Credit (NC).

**CHFY 010. CHASS Gateway Lecture Course (5)** Lecture, 3 hours; discussion, 1 hour; workshop, 1 hour. Prerequisite(s): first-year freshman standing in the College of Humanities, Arts, and Social Sciences. A College of Humanities, Arts, and Social Sciences course designed to introduce freshmen to the College's annual theme.

**CHFY 020. Theory and Practice of Peer Instruction (4)** Seminar, 4 hours. Prerequisite(s): consent of the CHASS F1RST Academic Advisor. An intensive examination of study development theory, retention models, and pedagogy related to peer-to-peer instruction. Graded Satisfactory (S) or No Credit (NC).

## Upper-Division Course

**CHFY 198-I. CHASS F1RST Individual Internship (1-4)** Consultation, .5-2 hours; internship, 3-12 hours; written work, 1-4 hours. Prerequisite(s): approval of the CHASS F1RST Academic Coordinator. Provides on-campus opportunities in the CHASS F1RST office to acquire skills and experience for future endeavors. Course is repeatable to a maximum of 8 units.

# Chemical and Environmental Engineering

**Subject abbreviations: CEE, CHE, ENVE**  
**The Marlan and Rosemary Bourns**  
**College of Engineering**

Nosang Myung, Ph.D., Chair  
 Department Office, A242 Bourns Hall  
 (951) 827-2859; [www.cee.ucr.edu](http://www.cee.ucr.edu)

### Professors

David R. Cocker, Ph.D.  
 Robert Haddon, Ph.D. *Distinguished Professor*  
 (Chemistry/Chemical and Environmental Engineering)  
 Mark R. Matsumoto, Ph.D.  
 Ashok K. Mulchandani, Ph.D.  
 Nosang Myung, Ph.D.  
 Jianzhong Wu, Ph.D.  
 Charles Wyman, Ph.D., *Ford Motor Company Chair*  
*in Environmental Engineering*

### Professor Emeritus

Joseph M. Norbeck, Ph.D.

### Associate Professors

Sharon Walker, Ph.D., *John Babbage Chair* in  
*Environmental Engineering*

### Assistant Professors

Akua A. Asa-Awuku, Ph.D.  
 Phillip Christopher, Ph.D.  
 Xin Ge, Ph.D.  
 David Kisailus, Ph.D.  
 Ian Wheeldon, Ph.D.

\*\*

### Adjunct Professors

Wilfred Chen, Ph.D.  
 David Cwiertny, Ph.D.  
 Wayne Miller, Ph.D.  
 Yushan Yan, Ph.D.

### Cooperating Faculty

Christopher Amrhein, Ph.D. (Environmental Sciences)

Matthew J. Barth, Ph.D. (Electrical Engineering)  
 Heejung Jung, Ph.D. (Mechanical Engineering)  
 John Y.-J. Shyy, Ph.D. (Biomedical Sciences)  
 Paul J. Ziemann, Ph.D. (Environmental Sciences)

## Majors

The Department of Chemical and Environmental Engineering offers B.S. degrees in Chemical Engineering and in Environmental Engineering, and M.S. and Ph.D. degrees in Chemical and Environmental Engineering. For more details, see [www.cee.ucr.edu](http://www.cee.ucr.edu).

**Chemical Engineering** focuses on transforming raw materials into useful everyday products. Chemical engineers turn the discoveries of chemists and physicists into commercial realities. They find work in a variety of fields including pharmaceuticals, materials, chemical, fuels, pollution control, medicine, and nuclear and electronic industries. At UCR, the B.S. degree in Chemical Engineering offers students three options: Biochemical Engineering, focusing on biochemical processes; Bioengineering, focusing on the biomedical industry; or Chemical Engineering, emphasizing traditional chemical engineering issues.

The program's educational objectives are to produce graduates who demonstrate in their careers and professional pursuits the following:

- An ability to apply mathematics, engineering principles, computer skills, and natural sciences to chemical engineering practice
- Application of fundamental chemical engineering principles at an advanced level, and competence in synthesizing knowledge from multiple disciplines to develop and evaluate design solutions.
- Engagement in chemical engineering careers in diverse areas including bioengineering, nanotechnology, petrochemicals, alternative energy, and semiconductor manufacturing.
- Pursuit of graduate education and research in chemical engineering at major research universities.
- Exercise professional responsibility and sensitivity to a broad range of societal concerns, such as ethical, environmental, economic, regulatory, and global issues
- Effective performance in a team environment, outstanding communication, and involvement in personal and professional growth activities.

The Chemical Engineering B.S. degree at UCR is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700.

**Environmental Engineering** deals with design and construction of processes and equipment intended to lessen the impact of man's activities on the environment. With the growing importance of environmental quality, the environmental engineer plays a pivotal role in modern industrial activity. Environmental engineers are involved in a wide range of activities including the design of alternative fueled vehicles, the

development of renewable energy sources, the design of equipment for solid waste collection and disposal, municipal and industrial wastewater treatment, air pollution control systems, and hazardous waste management. At UCR, the B.S. degree in Environmental Engineering allows students to concentrate on air and/or water quality.

The program's educational objectives are to produce graduates who demonstrate in their careers and professional pursuits the following:

- An ability to apply mathematics, engineering principles, computer skills, and natural sciences to environmental engineering practice
- Application of fundamental environmental engineering principles at an advanced level, and competence in synthesizing knowledge from multiple disciplines to develop and evaluate design solutions.
- Engagement in environmental engineering careers in diverse areas including sustainability, air quality and pollution control, water quality engineering, bioremediation, and green engineering.
- Pursuit of graduate education and research in environmental engineering at major research universities
- Exercise professional responsibility and sensitivity to a broad range of societal concerns, such as ethical, environmental, economic, regulatory, and global issues
- Effective performance in a team environment, outstanding communication, and involvement in personal and professional growth activities.

The Environmental Engineering B.S. degree at UCR is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700.

All undergraduates in the College of Engineering must see an advisor at least annually. Visit [student.engr.ucr.edu](http://student.engr.ucr.edu) for details.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Chemical Engineering major and the Environmental Engineering major use the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. BIOL 005A, BIOL 05LA
2. CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
3. MATH 008B or MATH 009A

## Major Requirements

### Chemical Engineering

Students must choose either a Biochemical Engineering, Chemical Engineering, Bioengineering or Nanotechnology option.

1. Lower-division requirements (62 units)
  - a) BIOL 005A, BIOL 05LA
  - b) CHEM 001A, CHEM 001B, CHEM 001C  
CHEM 01LA, CHEM 01LB, CHEM 01LC
  - c) CS 010
  - d) MATH 008B or MATH 009A,  
MATH 009B, MATH 009C, MATH 010A,  
MATH 010B, MATH 046
  - e) PHYS 040A, PHYS 040B, PHYS 040C
2. Upper-division requirements (76 units)
  - a) CEE 158
  - b) CHEM 112A, CHEM 112B, CHEM 112C
  - c) CHE 100, CHE 110A, CHE 110B,  
CHE 114, CHE 116, CHE 117, CHE 118,  
CHE 120, CHE 122, CHE 160B,  
CHE 160C, CHE 175A, CHE 175B
  - d) CHE 130/ENVE 130,  
CHE 160A/ENVE 160A
  - e) ENGR 118
3. Option requirements: choose one option
  - a) Biochemical Engineering option (20 units)
    - (1) BCH 110A
    - (2) BIOL 121/MCBL 121
    - (3) CEE 010
    - (4) CHE 124, CHE 124L
    - (5) Four (4) units of technical electives  
chosen from CEE 132, CEE 135,  
CHE 140, CHE 150, CHE 171,  
ENVE 121
  - b) Chemical Engineering option (18 units)
    - (1) CEE 010, CEE 125
    - (2) Twelve (12) units of technical electives  
chosen from CEE 132, CEE 135,  
CHE 102, CHE 136, CHE 171,  
ENVE 120, ENVE 133, ENVE 134,  
ENVE 138
  - c) Bioengineering option (24–26 units)
    - (1) BCH 110A, BCH 110B
    - (2) BIOL 005B, BIOL 005C
    - (3) CEE 011
    - (4) Six to eight (6–8) units of technical  
electives chosen from  
BIEN 140A/CEE 140A,  
BIEN 140B/CEE 140B, BIOL 107A,  
BIOL 107B, BIOL 115,  
BIOL 121/MCBL 121, BIOL 128/  
CBNS 128, CEE 147, CEE 159/  
BIEN 159, CHE 124, CHE 140, CHE 150
  - d) Nanotechnology option (21 units)
    - (1) CEE 010
    - (2) CHE 105
    - (3) CHE 161
    - (4) CEE 135
    - (5) Eight (8) units of technical electives  
chosen from CHE 102, CHE 131,

ENVE 133, ME 114, MSE 160,  
MSE 161

Visit the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu) for a sample program.

### Environmental Engineering

Students must choose either an Air Pollution Control Technology or a Water Pollution Control Technology option.

1. Lower-division requirements (68 units)
  - a) BIOL 005A, BIOL 05LA
  - b) CEE 010
  - c) CHEM 001A, CHEM 001B, CHEM 001C,  
CHEM 01LA, CHEM 01LB, CHEM 01LC
  - d) CS 010
  - e) MATH 008B or MATH 009A,  
MATH 009B, MATH 009C, MATH 010A,  
MATH 010B, MATH 046
  - f) ME 010
  - g) PHYS 040A, PHYS 040B, PHYS 040C
2. Upper-division requirements (78 units)
  - a) CEE 158
  - b) CHEM 112A, CHEM 112B
  - c) CHE 100, CHE 114, CHE 120
  - d) ENGR 118
  - e) ENSC 100/SWSC 100
  - f) ENVE 120, ENVE 133, ENVE 135,  
ENVE 142, ENVE 146, ENVE 160B,  
ENVE 160C, ENVE 171, ENVE 175A,  
ENVE 175B
  - g) ENVE 130/CHE 130,  
ENVE 160A/CHE 160A
3. Option requirements: choose one option (12 units)
  - a) Air Pollution Control Technology option
    - (1) CHE 116
    - (2) ENVE 134
    - (3) Choose one from CEE 125, CEE 132,  
CHE 102, ENSC 135/CHEM 135/  
ENTX 135, ENVE 144/ENSC 144,  
ENVE 138, ENVE 145
  - b) Water Pollution Control Technology option
    - (1) CHE 124 or ENVE 121
    - (2) Choose one from CEE 125, CHE 116,  
ENSC 136, ENSC 163
    - (3) Choose one from CEE 132, ENSC 155,  
ENVE 144/ENSC 144, ENVE 145

Visit the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu) for a sample program.

## Graduate Program

The Graduate Program in Chemical and Environmental Engineering offers training leading to the degrees of M.S. and Ph.D. in Chemical and Environmental Engineering. Fields of specialization include biochemical engineering and bio-

engineering, environmental biotechnology, air quality systems engineering, water quality systems engineering, thermodynamics, advanced materials, and nanotechnology.

**Combined B.S. + M.S. Five-Year Program** The college offers combined B.S.+ M.S. programs in both Chemical Engineering and Environmental Engineering designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, a combined SAT Reasoning score above 1950 (or ACT plus Writing equivalent), complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

**Admission** Applicants should have a degree in chemical and environmental engineering or closely related fields, have a satisfactory overall GPA from their undergraduate studies, good letters of recommendation, and high scores on the GRE General Test. Normally, students admitted to regular standing have satisfied all prerequisite course work. Under special circumstances, students who have not completed all undergraduate requirements may be admitted provided that the deficiencies are corrected to the satisfaction of the student's advisory committee within the first year of graduate study. Courses taken for this purpose do not count towards an advanced degree. International students, permanent residents, and even U.S. citizens whose native language is not English and who do not have a bachelor's or postgraduate degree from an institution where English is the exclusive language of instruction must complete the Test of English as a Foreign Language (TOEFL) with a minimum score of 550 (paper-based test), 213 (computer-based), or 80 (internet-based).

**Language Requirement** All students whose native language is not English must achieve a "clear pass" on the TAST or SPEAK test before the completion of their first year or they will be asked to leave the program. However, for those who receive a "conditional pass," a departmental committee will evaluate their English proficiency before a final decision is made.

**Course Work** To ensure that advanced degree recipients in the graduate program have advanced knowledge in mathematics and chemical engineering principles that form the foundation for chemical and environmental engineering, a core course program has been implemented. All M.S. and Ph.D. students must participate in the core course program. Students who have completed these (or equivalent) courses elsewhere may petition to have the core course requirement waived or some of their units transferred (see the Graduate Division policy for transferring course units). Competency in these areas will be tested as part of the comprehensive exam for M.S.

students and in the written preliminary examination for Ph.D. students. The current core courses are as follows:

CEE 200 (Advanced Engineering Computations)

CEE 202 (Transport Phenomena)

CEE 204 (Advanced Kinetics and Reaction Engineering)

CEE 206 (Advanced Chemical Engineering Thermodynamics)

Incoming students without a B.S. degree in chemical or environmental engineering must demonstrate competency in these areas either by taking the appropriate undergraduate courses and/or by passing the written preliminary exam. At UCR, the required courses are CHE 100, CHE 110A, CHE 110B, ENVE 171, CHE 114, CHE 116, CHE 120, CHE 130, and ENGR 118. Students may also be required to take some of the above courses to satisfy the prerequisites of the core graduate courses.

Each quarter, all M.S. and Ph.D. students in residence must enroll in CEE 286 (Colloquium in Chemical and Environmental Engineering). In addition, all M.S. and Ph.D. students must participate each year in the CEE Graduate Student Symposium, usually held just before the beginning of the fall quarter.

## Master's Degree

The Department of Chemical and Environmental Engineering offers the M.S. degree in Chemical and Environmental Engineering.

**Plan I (Thesis)** requires completion of a minimum of 36 units of approved course work including the core courses and submission of an acceptable M.S. thesis. At least 24 of these units must be in regular lecture graduate courses (200 series courses). No more than 4 units of CEE 290 or CEE 297 combined and 6 units of CEE 286 or special topics courses (CEE 250 or CEE 260 series) may apply towards the 36 units.

**Plan II (Comprehensive Examination)** requires completion of a minimum of 36 units of approved course work including the core courses and successful passage of a comprehensive examination. At least 28 of these units must be in regular lecture graduate courses (200-series courses), and none may be in courses numbered CEE 286, CEE 290, CEE 297, CEE 299, or CEE 302. Typically, the examination is a six-hour written, closed-book examination emphasizing fundamental knowledge and breadth of the study area rather than specifics covered in individual courses. An oral follow-up session may be requested by the examination committee following its evaluation of the written exam. No more than two attempts to pass the exam are allowed. Students who fail the exam once and then want to switch to the thesis plan should contact the graduate advisor. Students who fail the exam twice may not switch to the thesis plan.

**For the M.S. degree**, students must complete a minimum of three quarters in residence in the

UC with a GPA of 3.00 or better in all 100- and 200-level course work related to the degree.

**Thesis Committee** The committee consists of three members. The student and advisor nominate the committee before the end of the first year with the concurrence of the graduate committee. After review of the nominations, the dean of the Graduate Division appoints the committee on behalf of the Graduate Council. The committee, once approved by the graduate dean, rather than the department, becomes responsible for the student's academic guidance and evaluation. The chairman of the committee is the director of the candidate's research and is normally a faculty member of the CEE department or a cooperating faculty member. A member may be appointed who is a researcher on campus, from off-campus, or a visiting lecturer within the department; however, a memo indicating the academic degree and affiliation of the nominated member, as well as a curriculum vitae, must accompany such a request. (Memos need not accompany the nomination of an adjunct faculty member.) After the committee is formed, the committee must approve the subject of the thesis. A joint meeting of the committee members and the student should be held before work on the thesis is begun to ensure the topic is clear and acceptable to all. Once the thesis is completed, all three members of the committee must approve the thesis and sign the title page. Students must give a departmental seminar presentation of their thesis work to the department and members of the academic community before completing the thesis.

**Normative Time to Degree** 6 quarters

## Doctoral Degree

The Department of Chemical and Environmental Engineering offers the Ph.D. degree in Chemical and Environmental Engineering. Satisfying the requirements for the degree consists of four parts:

1. Successful completion of an approved program of course work
2. Passing a written preliminary examination
3. Approval of a dissertation proposal
4. Defense and approval of the dissertation

**Course Work** Upon choosing a faculty advisor, each Ph.D. student is appointed a Ph.D. advisory committee consisting of two CEE faculty members and the faculty advisor. This advisory committee is responsible for guiding the students in formulating their research activities and preparing for the preliminary and qualifying exams.

The program of course work is formulated by each student and a faculty advisor in the first or second quarter after admission to the program and must be approved by the student's advisor and advisory committee. Every student must complete a program of study that includes:

1. A major area of study intended to increase the student's depth of knowledge in an engineering research specialty and

2. A minor area of study intended to support and increase the student's breadth of knowledge in the major area

The CEE graduate program requires a coherent program of

1. Sixteen (16) units of core courses and
2. Eight (8) units of graduate and/or upper-division work approved by the advisory committee

None of these credits may be in courses numbered between CEE 250 and CEE 270, CEE 286, CEE 290, CEE 297, CEE 299, or CEE 302.

**Preliminary Examination** The preliminary examination tests students' understanding of the fundamental principles of chemical and environmental engineering at the undergraduate level. This comprehensive examination consists of three written tests in three different areas selected from the following five subjects:

1. Thermodynamics
2. Kinetics
3. Transport (heat and mass transfer, fluid dynamics)
4. Air pollution control and engineering
5. Water quality engineering

The three subjects selected should be closely connected to the student's undergraduate training and approved by the student's advisory committee. Students who fail any portion of the exam are granted a final attempt to pass a makeup written examination that includes an oral defense of their answers in front of a faculty committee. Students who fail one or two subjects after the retest must enroll in remedial undergraduate courses and pass with a grade of "B+" or better. Credits from these remedial courses do not count toward the Ph.D. course work requirement. Students who fail all three subjects after the retest must leave the Ph.D. program.

**Teaching Requirement** All students must be employed as teaching assistants for at least one quarter. All TAs must take CEE 302 (Teaching Practicum) to help them learn effective teaching methods such as handling discussion sections; preparing and handling laboratory sections; preparing and grading homework, examinations, and lab reports; and student relations.

**Oral Qualifying Examination** Selection of the Qualifying Committee is as follows: 2 members are selected by the Graduate Committee, 2 members are selected by the student, and the student's advisor will chair the committee. All members of the qualifying committee are expected to have the appropriate expertise to guide and evaluate a candidate's research. No more than 1 member can be a non-academic senate member. After review of the nominations, the dean of the Graduate Division appoints the committee on behalf of the Graduate Council. This committee becomes responsible for the student's academic guidance and evaluation until advancement to candidacy and administers the qualifying examination.

**Dissertation Proposal** After successful completion of the written preliminary examination, each student, with advisement from an advisor, prepares a dissertation proposal. Typically, students submit a dissertation proposal to their qualifying committee within one year after successfully completing the written preliminary examination. The proposal should clearly demonstrate the student's adequate preparation for the completion of the thesis research, which includes but is not limited to a thorough review of the pertinent literature, a presentation and discussion of the candidate's own research, and a detailed research plan with sufficient breadth and depth for the completion of the thesis. The qualifying committee chair schedules an oral defense normally within one month of the written proposal submission. The presentation is given only to the dissertation committee members.

The oral presentation/defense of the proposal focuses on the dissertation problem. Students should demonstrate considerable depth of knowledge in the student's area of specialization and a clear understanding of the research methods that are needed for successful completion of the dissertation research. The oral presentation/defense begins with a presentation by students on their dissertation topic and is followed by questions and suggestions from the qualifying committee.

On the basis of the written proposal and oral defense, the qualifying committee decides whether the student should be advanced to candidacy, asked to modify and enhance the proposal, or requested to withdraw from the program.

**Dissertation and Final Oral Examination** Following advancement to candidacy, students formally focus on their dissertation research. The progress of the dissertation is monitored by the student's dissertation committee. Candidates should interact frequently with members of their dissertation committee to insure that dissertation progress is acceptable.

The graduate committee nominates and approves the dissertation committee after consideration of the suggestions made by the student and thesis advisor. The dissertation committee consists of a minimum of three UCR Academic Senate members. The chair and majority of members must be from Chemical and Environmental Engineering. All committee members should be in a position to offer guidance and be able to judge the scholarship of the dissertation work. Upon recommendation of the graduate advisor, doctoral dissertation committees are appointed by the dean of the Graduate Division.

After completing the dissertation research, students must submit a written copy of the dissertation for approval for defense by the student's dissertation committee. Once a draft has been approved, an oral defense of the dissertation is scheduled. This defense consists of a seminar open to the entire academic community, followed by a question-and-answer

period conducted by the dissertation committee.

Students must complete at least six quarters in residence in the UC with a GPA of 3.00 or better in all 100- and 200-level course work related to the degree.

**Normative Time to Degree** Three years for students with a UCR M.S. degree in Chemical and Environmental Engineering (five years for those without an M.S. degree in Chemical and Environmental Engineering)

## Lower-Division Courses

**CEE 010. Introduction to Chemical and Environmental Engineering (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): none. An introduction to chemical and environmental engineering for engineering and nonengineering majors. Aims to enrich an appreciation of chemical, biochemical, and environmental engineering. Discusses typical careers, key applications, latest developments and the need to engage in lifelong learning in the field. Provides hands-on experiences and includes a field trip. Graded Satisfactory (S) or No Credit (NC).

**CEE 011. Introduction to Bioengineering (2)** Lecture, 1 hour; laboratory, 3 hours. An introduction to bioengineering for engineering and nonengineering majors. Discusses the application of concepts and methods of the physical sciences and mathematics to problems in the life sciences. Covers typical careers, key applications, latest developments in the field, and the need to engage in lifelong learning. Provides hands-on experiences and includes a field trip. Graded Satisfactory (S) or No Credit (NC).

## Upper-Division Courses

**CEE 125. Analytical Methods for Chemical and Environmental Engineers (4)** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): CHEM 001C, CHEM 011C. Topics include chromatographic separations, mass spectrometry, atomic absorption, and electrophoresis. Presents total carbon analysis as an introduction to analytical methods and their use in the chemical and environmental engineering fields.

**CEE 132. Green Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): senior standing or consent of instructor. An introduction to the design, commercialization, and use of feasible and economical processes and products that minimize risks to human health and the environment. Topics covered include environmental risk assessment, regulations, chemical process flow-sheet analysis for pollution prevention, product life-cycle assessment, and industrial ecology. Credit is awarded for only one of CEE 132 or CEE 232.

**CEE 135. Chemistry of Materials (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040C, CHEM 112A. An introduction to the synthesis, structure, properties, and performance of modern materials. Topics include the science of materials, bonding and structure, the strength of materials, electrons in materials, semiconductors, superconductors, and optical properties of materials.

**CEE 140A. Biomaterials (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, CHEM 112C, MATH 010B, PHYS 040B. Covers the principles of materials science and engineering, with attention to topics in bioengineering. Explores atomic structures, hard treatment, fundamentals of corrosion, manufacturing processes, and characterization of materials. Cross-listed with BIEN 140A.

**CEE 140B. Biomaterials (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 140A/CEE 140A. Covers the structure-property relations of metals, ceramics, polymers, and composites, as well as hard and soft tissues such as bone, teeth, cartilage, ligament, skin, muscle, and vasculature. Focuses on behavior of materials in the physiological environment. Cross-listed with BIEN 140B.

**CEE 147. Bio-Microelectromechanical Systems (BioMEMS) (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C, CEE 011, CHEM 112C, MATH 046, PHYS 040C; or consent of instructor. An introduction to bio-microelectromechanical systems with applications in bioengineering. Topics include biocompatible materials, device fabrication techniques, and principles of practical biomedical devices. Exposes students to the biotech industry and possible career paths in bioengineering.

**CEE 158. Professional Development for Engineers (3)** Lecture, 3 hours. Prerequisite(s): upper-division standing. A review of various topics relevant to the professional development of chemical engineers. Includes career paths; interview strategies; professional registration and preparation for certification examinations; ethics; risk management and environmental health and safety; regulatory issues; and lifelong learning.

**CEE 159. Dynamics of Biological Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100 or BCH 110A. Covers engineering principles for the analysis and modeling of biological phenomena. Topics include molecular diffusion and transport, membranes, ligand-bioreceptor interactions, enzyme kinetics, and dynamics of metabolic pathways. Examines the application of these principles to the design of bioreactors, bioassays, drug delivery systems, and artificial organs. Cross-listed with BIEN 159.

**CEE 197. Research for Undergraduates (1-4)** Outside research, 3-12 hours. Prerequisite(s): consent of instructor and Chemical and Environmental Engineering undergraduate program advisor. Directed research on a topic relevant to chemical and environmental engineering. Requires a final written report. Course is repeatable to a maximum of 8 units.

## Chemical Engineering

### Upper-Division Courses

**CHE 100. Engineering Thermodynamics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C, MATH 010A, PHYS 040B; or consent of instructor. An introduction to engineering thermodynamics with emphasis on chemical and environmental engineering systems. Topics include concepts of equilibrium, temperature, and reversibility; the first law and concept of energy; and the second law and concept of entropy. Also examines equations of state, thermodynamic properties, and engineering applications used in the analysis and design of closed and open systems. Credit is awarded for only one of CHE 100 or ME 100A.

**CHE 102. Catalytic Reaction Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 122 or consent of instructor. Principles of surface reactions and heterogeneous catalysis. Catalyzed reaction kinetics, heterogeneous reactions, diffusion and heterogeneous catalysis, analysis and design of heterogeneous reactors.

**CHE 105. Introduction to Nanoscale Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):

CEE 135, MATH 010A, PHYS 040C; or consent of instructor. An introduction to nanotechnology engineering and its various applications. Includes electromagnetic waves and quantum mechanics; synthesis of nanostructures; assembly of nanostructures; and traditional and nontraditional methods of nanolithography and interactions between electronic and optical properties. Also covers organic heterostructures, nanotubes, and quantum computing.

**CHE 110A. Chemical Process Analysis (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C, MATH 009C, PHYS 040B; or consent of instructor. Introduces the principles of conservation of mass in chemical process systems. Topics include the development of steady-state mass balances, and application of mass balances to existing industrial processes.

**CHE 110B. Chemical Process Analysis (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): CHE 110A with a grade of "C-" or better; or consent of instructor. Applies principles of conservation of energy to chemical process systems. Topics include the development of steady-state and unsteady-state energy balances as well as combined mass and energy balances in industrial processes.

**CHE 114. Applied Fluid Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 110A, MATH 010A, MATH 046, PHYS 040B; or consent of instructor. An introduction to fluid statics, fluid flow, and flow of compressible and incompressible fluids in conduits and open-channel flow. Also covers flow past immersed bodies, transportation and metering of fluids, and agitation and mixing of liquids. Credit is awarded for only one of CHE 114 or ME 113.

**CHE 116. Heat Transfer (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100, CHE 114 with a grade of "C-" or better; or consent of instructor. An analysis of heat transfer for Chemical Engineering and Environmental Engineering majors. Topics include steady- and unsteady-state heat conduction, forced convection, basic radiation heat transfer, and design of heat exchangers. Credit is awarded for only one of CHE 116 or ME 116A.

**CHE 117. Separation Processes (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 116, CHE 120; or consent of instructor. Covers fundamental concepts and practical techniques for designing equipment based on equilibrium stage processes. Explores gas-liquid absorption, distillation, liquid-liquid extraction, solid-liquid extraction, humidification, drying, and membrane processes.

**CHE 118. Process Dynamics and Control (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 117, CHE 122, ENGR 118; or consent of instructor. Fundamentals of process control. Feedback and feed-forward control of dynamic processes. Frequency response analysis. Introduction to multivariable control.

**CHE 120. Mass Transfer (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114 with a grade of "C-" or better, MATH 046; or consent of instructor. Introduction to analysis of mass transfer in systems of interest to chemical and environmental engineering practice. Explores transport of matter by diffusion, free, and forced convection.

**CHE 122. Chemical Engineering Kinetics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 110B, MATH 010A, MATH 046; or consent of instructor. Introduction to homogeneous and heterogeneous kinetics and reactor design for chemical and biochemical processes.

#### **CHE 124. Biochemical Engineering Principles (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A, BIOL 121/MCBL 121 (BIOL 121/MCBL 121 may be taken concurrently), CHE 120, CHE 122; or consent of instructor. Examines the principles of biochemical engineering. Topics include kinetics of enzymatic reactions and microbial growth, batch and continuous culture reactors, product formulation, and nutrient utilization. Also studies oxygen transfer, bioreactor scale-up, air and media sterilization, fundamentals of bioreactor design, and bioseparations.

#### **CHE 124L. Biochemical Engineering Laboratory (2)**

Laboratory, 6 hours. Prerequisite(s): CHE 124 or consent of instructor. Laboratory practices in biochemical engineering. Determination of microbial kinetics and biologically mediated reactions, oxygen transfer coefficients. Batch and continuous culturing, air and media sterilization, bioseparations.

#### **CHE 130. Advanced Engineering Thermodynamics (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100 or consent of instructor. Advanced study of chemical thermodynamics and their applications to chemical and environmental engineering processes. Applies principles for the thermodynamic behavior of pure solutions and mixtures, phases, and chemical equilibria for homogeneous and heterogeneous systems to a variety of processes common to chemical and environmental engineering. Cross-listed with ENVE 130.

**CHE 131. Electrochemical Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 116, CHE 122, CHE 130; or consent of instructor. Explores role of thermodynamics, charge transfer kinetics, and mass transfer on behavior of electrochemical systems. Includes cell thermodynamics, faradaic and non-faradaic rate processes, ionic transport, nucleation and growth theories. Shows applications to chemical sensors, batteries, corrosion, and thin film deposition. Provides in-class demonstrations to illustrate concepts.

#### **CHE 136. Advanced Topics in Heat Transfer (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 116, CHE 120. Advanced study of the computational and theoretical methods associated with heat transfer, fluid flow, and other related processes. Topics include phenomena of heat conduction, convection, and the calculation of flow fields.

**CHE 140. Cell Engineering (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHE 124 or consent of instructor. Introduction to genetic and environmental manipulation of cells for production of proteins and for enhanced biocatalytic and synthetic activities. Cloning and gene expression in different host systems, posttranslational processing, metabolic controls and kinetics, *in vivo* NMR spectroscopy, cell modeling, and sensitivity analysis.

**CHE 150. Biosensors (4)** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BCH 184 or CHE 124 or consent of instructor. Introduces the fundamentals and applications of biosensors. Topics on enzyme-, whole cell-, tissue-, and antibody/antigen-based electrochemical, optical, and piezoelectric biosensors for applications in bioprocess monitoring and control, environmental monitoring, and health care are covered.

#### **CHE 160A. Chemical and Environmental Engineering Laboratory (3)**

Laboratory, 6 hours; written work, 3 hours. Prerequisite(s): CHE 114, CHE 120. Involves laboratory exercises in chemical and environmental engineering. Experiments cover physical measurements, fluid mechanics, and mass transfer. Emphasizes experimental design, analysis of results,

and preparation of engineering reports. Cross-listed with ENVE 160A.

#### **CHE 160B. Chemical Engineering Laboratory (3)**

Laboratory, 6 hours; written work, 3 hours. Prerequisite(s): CHE 116, CHE 122. Consists of laboratory exercises in chemical engineering. Includes experiments in physical measurements, heat transfer, reactor analysis, and chemical kinetics. Emphasis is on experimental design, analysis of results, and preparation of engineering reports.

#### **CHE 160C. Chemical Engineering Laboratory (3)**

Laboratory, 6 hours; written work, 3 hours. Prerequisite(s): CHE 117, CHE 118 (CHE 117 and CHE 118 may be taken concurrently), CHE 122. Consists of laboratory exercises in chemical engineering. Includes experiments and simulations in separation processes and in process control. Emphasis is on experimental design, analysis of results, and preparation of engineering reports.

#### **CHE 161. Nanotechnology Processing Laboratory (3)**

Laboratory, 6 hours; written work, 3 hours. Prerequisite(s): CHE 100 or consent of instructor. An introduction to growth and characterization techniques that involve nanomaterials and devices. Includes preparing thin films; synthesizing Au and CdS nanoparticles; synthesizing carbon nanotubes; synthesizing alumina nanotemplate; synthesizing gold and nickel nanowires; and assembling of nanowires. Also includes imaging samples with optical, scanning electron microscope, scanning tunneling microscope, and atomic force microscope.

#### **CHE 171. Pollution Control for Chemical Engineers (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHE 117 or consent of instructor. Principles of industrial pollution control in chemical engineering plants. Regulations, criteria, measurements, and pollution control systems associated with air, wastewater, and solid waste management.

#### **CHE 175A. Chemical Process Design (4)**

Lecture, 1 hour; laboratory, 6 hours; consultation, 1 hour. Prerequisite(s): CHE 117, CHE 122, MATH 010B, senior standing in Chemical Engineering; CHE 118 (may be taken concurrently). Introduction to chemical process plant design procedures through economic analysis and actual design of chemical processes. Addresses practical applications to current chemical and biochemical processes and economic constraints. Concentrates on general design considerations and economic principles. Graded In Progress (IP) until CHE 175A and CHE 175B are completed, at which time a final, letter grade is assigned.

#### **CHE 175B. Chemical Process Design (4)**

Lecture, 1 hour; laboratory, 6 hours; consultation, 1 hour. Prerequisite(s): CHE 175A; senior standing in Chemical Engineering. Introduction to chemical process plant design procedures through economic analysis and actual design of chemical processes. Topics address practical applications to current chemical and biochemical processes and economic constraints. Students complete a detailed analysis and process design of the projects begun in CHE 175A. A final report and oral presentation are required. Satisfactory (S) or No Credit (NC) grading is not available.

#### **CHE 190. Special Studies (1-5)**

Individual study, 3-15 hours. Prerequisite(s): upper-division standing; consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

# Environmental Engineering

## Upper-Division Courses

**ENVE 120. Unit Operations and Processes in Environmental Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120, ENVE 133; or consent of instructor. Fundamentals of physico-chemical unit processes used in environmental engineering. Addresses coagulation and flocculation, sedimentation, filtration, adsorption, redox processes, and heat and mass transfer processes.

**ENVE 121. Biological Unit Processes (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENVE 120 (may be taken concurrently), ENVE 142. An introduction to the theory and design of biological unit processes used in environmental engineering. Suspended growth processes, attached growth processes, digestion processes, and nutrient removal systems are covered.

**ENVE 130. Advanced Engineering Thermodynamics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100 or consent of instructor. Advanced study of chemical thermodynamics and their applications to chemical and environmental engineering processes. Applies principles for the thermodynamic behavior of pure solutions and mixtures, phases, and chemical equilibria for homogeneous and heterogeneous systems to a variety of processes common to chemical and environmental engineering. Cross-listed with CHE 130.

**ENVE 133. Fundamentals of Air Pollution Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040B, MATH 046, CHE 114, CHEM 112B, CHE 110A or ENVE 171; or consent of instructor. Covers principles, modeling, and design of systems for atmospheric emission control of pollutants such as photochemical smog and by-products of combustion. Explores the effects of air pollution on health.

**ENVE 134. Technology of Air Pollution Control (4)** Lecture, 4 hours. Prerequisite(s): ENVE 133. Processes and design of control technologies for gaseous and particulate pollutants. Methods and design of ambient air quality measurements and air pollution source sampling for both gaseous and particulate pollutants.

**ENVE 135. Fate and Transport of Environmental Contaminants (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120, ENVE 133, ENVE 142, ENGR 118, CHEM 112B; or consent of instructor. Covers fate and transport of contaminants in the air, water, and soil environments. Addresses description and modeling of advection, dispersion, phase transfer, and chemical transformation mechanisms.

**ENVE 138. Combustion Engineering (4)** Lecture, 4 hours. Prerequisite(s): CHE 114, ENVE 133. Covers the fundamental development of the engineering and design principles underlying combustion engines and turbines and the associated emission control technology. Includes aspects of fuels, lubricants, instrumentation, chemistry of combustion, and kinetics related to the understanding of engineering processes, engine design, and emission control.

**ENVE 142. Water Quality Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114 or

ENVE 171; or consent of instructor. An introduction to the engineering aspects of water quality management. Addresses water quality characterization and modeling techniques for natural and engineered systems. Discusses application of chemical equilibrium and kinetic models to water quality.

**ENVE 144. Solid Waste Management (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002 or both BIOL 005A and BIOL 05LA; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; either both ENSC 001 (or ENSC 001H) and ENSC 002 (or ENSC 002H) or ENVE 171; MATH 009B (or MATH 09HB) or MATH 022; or consent of instructor. A study of the characterization, collection, transportation, processing, disposal, recycling, and composting of municipal solid waste. Emphasizes accepted management strategies and design procedures for recovering or disposing solid wastes while protecting public and environmental well-being. Cross-listed with ENSC 144.

**ENVE 145. Hazardous Waste Management (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENVE 120 and ENVE 142. Advanced course in the study of physio-chemical, thermal, and biological treatment of hazardous waste. Emphasis is placed on the technical understanding and design of physical, biological, and thermal treatment methods; transportation of hazardous waste; and hazardous waste characterization and site assessment.

**ENVE 146. Water Quality Systems Design (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114 or consent of instructor. Analysis and design of water conveyance systems including water distribution networks, wastewater and storm water collection systems, structures for flow measurement and control, and pumps and pump stations. Includes projects to develop design process skills including problem specification, modeling, and analysis.

**ENVE 160A. Chemical and Environmental Engineering Laboratory (3)** Laboratory, 6 hours; written work, 3 hours. Prerequisite(s): CHE 114, CHE 120. Involves laboratory exercises in chemical and environmental engineering. Experiments cover physical measurements, fluid mechanics, and mass transfer. Emphasizes experimental design, analysis of results, and preparation of engineering reports. Cross-listed with CHE 160A.

**ENVE 160B. Environmental Engineering Laboratory (3)** Laboratory, 6 hours; written work, 3 hours. Prerequisite(s): ENVE 133. Consists of laboratory exercises in environmental engineering. Includes experiments in physical measurements, reaction kinetics, reactor analysis, and air pollution engineering. Emphasis is on experimental design, analysis of results, and preparation of engineering reports.

**ENVE 160C. Environmental Engineering Laboratory (3)** Laboratory, 6 hours; written work, 3 hours. Prerequisite(s): ENVE 120, ENVE 142. Consists of laboratory exercises in environmental engineering. Includes experiments in physical measurements, water quality, and unit operations and processes. Emphasis is on experimental design, analysis of results, and preparation of engineering reports.

**ENVE 171. Fundamentals of Environmental Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C, MATH 009C, PHYS 040B; or consent of instructor. An introduction to mass and energy balances. Includes an overview of contaminants and their effects on human health and the environment. Provides a basic understanding of contaminants, their sources, and their movement and fate in the environment.

**ENVE 175A. Senior Design Project (4)** Lecture, 1 hour; laboratory, 6 hours; consultation, 1 hour.

Prerequisite(s): senior standing in Environmental Engineering. Under the direction of a faculty member, students (individually or in small teams with shared responsibilities) propose, design, build, and test environmental engineering devices or systems. A written report, giving details of the project and test results, and an oral presentation of the design aspects are required. Graded In Progress (IP) until ENVE 175A and ENVE 175B are completed, at which time a final, letter grade is assigned.

**ENVE 175B. Senior Design Project (4)** Lecture, 1 hour; laboratory, 6 hours; consultation, 1 hour.

Prerequisite(s): senior standing in Environmental Engineering; ENVE 175A. Under the direction of a faculty member, students (individually or in small teams with shared responsibilities) propose, design, build, and test environmental engineering devices or systems. A written report, giving details of the project and test results, and an oral presentation of the design aspects are required. Satisfactory (S) or No Credit (NC) grading is not available.

**ENVE 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing; consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

## Graduate Courses

**CEE 200. Advanced Engineering Computation (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENGR 118 or consent of instructor. Problem-solving techniques for basic engineering systems including heat and mass transfer, coupled reactions, fluid flow potential, and control.

**CEE 202. Transport Phenomena (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114, CHE 116, CHE 120, ENGR 118; or consent of instructor. Topics include transport phenomena, potential flow, and boundary layer theories with applications to simultaneous heat, momentum, and mass transfer. Introduces numerical techniques used to solve advanced transport phenomena problems.

**CEE 204. Advanced Kinetics and Reaction Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 102 or CHE 120 or consent of instructor. Emphasizes kinetics and mechanisms of heterogeneous reactions in different types of reactors. Specific topics include gas-solid noncatalytic reactions; catalytic surfaces and catalyst characterization; and adsorption, diffusion, reaction, and heat transfer in porous catalysts.

**CEE 206. Advanced Chemical Engineering Thermodynamics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 130/ENVE 130 or consent of instructor. Application of the laws of thermodynamics to phase and chemical reaction equilibrium. Introduction to statistical thermodynamics, molecular simulations, and the evaluation of thermodynamic properties from molecular simulations.

**CEE 210. Cell Engineering (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHE 124 or consent of instructor. Introduction to genetic and environmental manipulation of cells for production of proteins and for enhanced biocatalytic and synthetic activities. Topics include cloning and gene expression in different host systems, posttranslational processing, metabolic controls and kinetics, in vivo nuclear magnetic resonance spectroscopy, cell modeling, and sensitivity analysis.

**CEE 212. Bioseparations and Bioprocess**

**Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 124 or consent of instructor. Examines fundamentals of separation processes used to isolate and purify biochemical products such as whole cells, enzymes, food additives, and pharmaceuticals. Covers selected aspects of biochemical engineering such as microbial interactions, economics, and mathematical modeling of bioprocesses.

**CEE 220. Modeling Chemical, Biochemical, and**

**Environmental Processes (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Introduces simulation softwares and the use of numerical simulation to solve dynamic chemical, biochemical, and environmental problems. Topics include model formulation and development, model sensitivity studies, and application of simulations to chemical, biochemical, and environmental processes.

**CEE 221. Introduction to Microfluidics (4)**

Lecture, 4 hours. Prerequisite(s): CHE 160A/ENVE 160A or consent of instructor. Provides a theoretical and practical introduction to microfluidic devices. Covers traditional and new methods for making microfluidic devices and assembly of components into systems. Emphasizes the considerations underlying the design or operation of devices based on pressure-driven or electrokinetic flow. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CEE 225. Physical and Chemical Separation**

**Processes (4)** Lecture, 4 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Covers the fundamental and applied concepts of physical and chemical processes relevant to engineered and natural environmental systems. Topics include basic colloid chemistry and an introduction to DLVO theory, coagulation and flocculation, mechanisms of particle removal in filters and transport in porous media, absorption, disinfection, control of disinfection by-products, and advanced treatment processes such as membranes.

**CEE 230. Biosensors (4)**

Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BCH 110A, BCH 110B, BIOL 121/MCBL 121, CHE 124; or consent of instructor. Introduces the fundamentals and applications of biosensors. Covers enzyme-, whole cell-, tissue-, and antibody- or antigen-based electrochemical, optical, and piezoelectric biosensors. Applies such knowledge to bioprocess monitoring and control, environmental monitoring, and health care.

**CEE 231. Scattering and Reflectometry for Environmental, Material, and Biological**

**Applications (4)** Lecture, 3 hours; discussion, 5 hours per quarter; laboratory, 15 hours per quarter. Prerequisite(s): CEE 206 or equivalent. Covers experimental and theoretical aspects of conventional static and dynamic light scattering, small-angle X-ray scattering, small-angle neutron scattering, X-ray and neutron reflectivity for colloids and biological solutions, surfaces, and interfaces. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CEE 232. Green Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120 or consent of instructor. A study of the design, commercialization, and use of feasible and economical processes and products that minimize risks to human health and the environment. Topics include environmental issues, risk assessment, and regulations; flow of chemical and manufacturing unit processes and flow-sheet analysis for pollution prevention; product life-cycle assessment; and industrial ecology. May be taken

Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for only one of CEE 132 or CEE 232.

**CEE 233. Advanced Air Pollution Control and**

**Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 202, CEE 206, CHEM 112A, CHEM 112B, ENVE 133, ENVE 134; or consent of instructor. Covers principles necessary to understand the atmospheric behavior of air pollutants. Topics include gas- and aerosol-phase chemistry, atmospheric diffusion, removal processes and residence times, and the formation and fate of gas and aerosol pollutants.

**CEE 234. Vehicle Emissions Control Technology, Measurement Procedures, and Alternative Fuels (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers the nature of gaseous and particulate emissions and the technical aspects of energy efficiency from mobile sources. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CEE 241. Water Quality (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENVE 142 or consent of instructor. Topics include assessment of surface water and groundwater quality for beneficial uses, fate and transport of waterborne pollutants, and water quality modeling in natural and engineered systems.

**CEE 242. Pilot Plant Laboratory (4)** Lecture, 1 hour; laboratory, 9 hours. Prerequisite(s): ENVE 120, ENVE 121; or consent of instructor. Laboratory investigations of physical, chemical, and biological processes for water treatment, wastewater treatment, and soil remediation.

**CEE 245. Advanced Hydraulic Engineering (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114, ENVE 142 (ENVE 142 may be taken concurrently); or consent of instructor. An introduction to the basic methods of hydraulic engineering for water quality control. Topics include design and analysis of basic flow and water containment structures, sanitary and storm sewers, pumps and valves, and pipe networks. Emphasis is given to design projects aimed at developing skills in problem specification, modeling, and analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CEE 246. Surface and Interface Phenomena (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100 or ME 100A or consent of instructor. An introduction to colloid systems, capillarity, surface tension and contact angle, and micelles and microemulsions. Also covers adsorption and desorption at the solid-liquid interface, electrostatic forces, and colloid stability.

**CEE 247. Molecular Thermodynamics of Complex**

**Fluids (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 200, CEE 206, or consent of instructor. Introduces recent developments in applied thermodynamics and molecular simulations, with emphasis on current concerns in chemical and environmental engineering such as colloids, polymers, biomacromolecules, and fluids under inhomogeneous conditions.

**CEE 249. Integration of Computational and**

**Experimental Biology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B; MATH 009B or MATH 09HB; graduate standing. Multidisciplinary introduction to the mathematical concepts of design of experiments, information content, causation versus correlation, and statistical analysis with respect to hypothesis testing, model development, and parameter estimation. Covers state-of-the-art experimental techniques in proteomics, transcriptomics,

metabolomics, and genetics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BIEN 249.

**CEE 250. Special Topics in Chemical and**

**Environmental Engineering (1 or 2)** Seminar, 1-2 hours. Prerequisite(s): graduate standing. Seminar in selected topics in chemical and environmental engineering presented by graduate students, staff, faculty, and invited speakers. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CEE 251. Microbial Engineering and Environmental**

**Biotechnology (1 or 2)** Seminar, 1-2 hours. Discusses the recent development of novel biocatalysts and biological materials for degrading toxic pollutants or synthesizing environmentally friendly chemicals. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CEE 253. Biodegradation and Bioremediation (1 or 2)**

Seminar, 1-2 hours. Prerequisite(s): graduate standing. Reviews current research. Special emphasis is placed on biological techniques for air pollution control, bioremediation of methyl tert-butyl ether, and molecular techniques for microorganism monitoring. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**CEE 254. Organic Electronic Materials (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. A study of design, synthesis, purification, manufacture, and application of carbon-based electronic materials. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with CHEM 267.

**CEE 255. Special Topics in Water Quality**

**Engineering (1 or 2)** Seminar, 1-2 hours. Prerequisite(s): graduate standing. Involves reports and discussion by students, faculty, and visiting scholars on current research topics in water quality engineering. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CEE 256. Special Topics in Particulate Measurement**

**and Air Quality (1 or 2)** Seminar, 1-2 hours. Prerequisite(s): graduate standing. Topics include atmospheric chemistry, aerosol chemistry and physics, and measurement techniques used for source and ambient sampling of gases and aerosols. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**CEE 257. Special Topics of Bio-Nanotechnology (1-2)**

Seminar, 1 hour; consultation, 0-1 hour. Prerequisite(s): graduate standing or consent of instructor. Focuses on the application of nanotechnology for further developments in bioengineering and medicine. Students complete presentations on the latest developments in nanotechnology. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CEE 258. Biosensing and Biodegradation (1 or 2)**

Seminar, 1-2 hours. Prerequisite(s): graduate standing. Involves oral presentations and intensive small-group discussions of current literature on biological

detoxification of hazardous chemicals and biological-based sensors for environmental, clinical, food quality, and process monitoring. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

#### CEE 259. Special Topics in Materials

**Electrochemistry (1)** Seminar, 1 hour. Prerequisite(s): graduate standing. Topics include nanoelectrochemical systems, electrochemistry, bioelectrochemistry, magnetic materials, spintronics, microelectromechanical systems/nanoelectromechanical systems (MEMS/NEMS), nanosensor arrays, nanoelectronics, corrosion, fuel cells, batteries, thermoelectric materials, electroenzymology, electrodeposition, electroless deposition, and synthesis of nanowires and nanotubes. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable as topics change.

#### CEE 260. Structural Ordering in Colloidal

**Dispersions (1 or 2)** Seminar, 1-2 hours. Prerequisite(s): graduate standing. Introduces recent advances in understanding intercolloid forces and self-assembly of colloidal particles for the fabrication of new materials. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

#### CEE 261. Special Topics in Zeolites, Fuel Cells, and Nanostructured Materials (1 or 2)

Seminar, 1-2 hours. Prerequisite(s): graduate standing. Covers design, synthesis, and engineering of zeolite thin films for applications in semiconductors and in aerospace; development of fuel cell membranes and electrode catalysts and production of hydrogen; and synthesis and manipulation of nanomaterials. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

#### CEE 262. Special Topics in Systems Biology (1 or 2)

Seminar, 1-2 hours. Prerequisite(s): graduate standing. Consists of oral presentations and intense small-group discussions of the current literature and research on computational and experimental aspects of systems biology. Explores high-throughput experiments, experimental design, numerical methods, model development, written and oral presentation skills, ethics, and laboratory techniques. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

#### CEE 263. Membrane Separations (2)

Seminar, 2 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Covers theoretical and applied concepts of membrane separation processes. Topics may include basic membrane transport theory, membrane materials and formation processes, advanced colloid and surface chemistry, Derjaguin-Landau-Verwey-Overbeek (DLVO) theory on colloid stability, colloidal hydrodynamics, and transport in porous media. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

#### CEE 265. Special Topics in Microbial Fate and

**Transport in Aquatic Environments (1 or 2)** Seminar, 1 hour; individual study, 0-3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the theoretical and applied research currently being conducted in the area of microbial pathogen transport in natural and engineered aquatic systems. Topics include the theory of colloid transport and filtration, quantification and analysis of microbial adhesion or deposition kinetics, and whole-cell and molecular-scale microbial analysis techniques. Students who give class presentations receive credit for 2 units; other students receive credit for 1 unit. Graded

Satisfactory (S) or No Credit (NC). Course is repeatable.

**CEE 266. Special Topics in Biological Conversion of Biomass (1 or 2)** Seminar, 1 hour; individual study, 0-3 hours. Prerequisite(s): graduate standing. Consists of oral presentations and small group discussions of current and historic literature on biological conversion of biomass to fuels and chemicals. Students who make presentations receive credit for 2 units; other students receive credit for 1 unit. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change.

#### CEE 267. Special Topics in Bionanotechnology (2)

Seminar, 2 hours. Prerequisite(s): graduate standing. Introduces recent advances in biomimetics, biomimetalization, and bio-inspired materials for nanostructures, as well as for energy storage and conversion applications. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 18 units.

#### CEE 268. Special Topics in Environmental

**Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate standing. Addresses the key role that environmental chemical processes play in water quality, pollutant fate, and the development of strategies for the treatment and reuse of contaminated natural resources. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 18 units.

#### CEE 269. Special Topics in Aerosols and Climate (2)

Seminar, 2 hours. Prerequisite(s): graduate standing. Introduces research at the interface of particle air quality and climate. Focuses on the effects of particle formation and composition on climate. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

#### CEE 286. Colloquium in Chemical and Environmental

**Engineering (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing. Lectures on a current research topic in chemical engineering, environmental engineering, and other related fields presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

#### CEE 290. Directed Studies (1-6)

Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics in chemical and environmental engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

#### CEE 292. Concurrent Studies in Chemical and

**Environmental Engineering (1-4)** Outside research, 3-12 hours. Prerequisite(s): consent of instructor. To be taken concurrently with a 100-series course but on an individual basis. Devoted to specific additional projects related to the 100-series course. Faculty provide guidance and evaluation throughout the quarter. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

#### CEE 297. Directed Research (1-6)

Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Research conducted under the supervision of a faculty member on selected problems in chemical and environmental engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

#### CEE 298-I. Individual Internship (1-12)

Written work, 1-12 hours; internship, 2-24 hours. Prerequisite(s): graduate standing; consent of instructor. Individual

apprenticeship in chemical and environmental engineering with an approved professional individual or organization, and a faculty member. A written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

#### CEE 299. Research for the Thesis or Dissertation (1-

**12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. Research in chemical and environmental engineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

#### CEE 302. Teaching Practicum (1-4)

Seminar, 1-4 hours. Prerequisite(s): appointment as a teaching assistant or associate in Chemical and Environmental Engineering. Topics include effective teaching methods such as those involved in leading discussion sections, preparing and grading examinations, and student-instructor relations in lower- and upper-division Chemical Engineering and Environmental Engineering courses. Required each quarter of teaching assistants and associates in Chemical and Environmental Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

## Chemistry

Subject abbreviation: CHEM

College of Natural and Agricultural Sciences

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Leonard Mueller, Ph.D., Vice Chair  
Department Office, 236 Chemical Sciences I  
(951) 827-7366; [chem.ucr.edu](http://chem.ucr.edu)

#### Distinguished Professors

Guy Bertrand, Ph.D.  
David F. Bocian, Ph.D.  
Robert Haddon, Ph.D. (Chemistry/Chemical and Environmental Engineering)  
Dallas L. Rabenstein, Ph.D.  
Christopher A. Reed, Ph.D.  
Francisco Zaera, Ph.D.

#### Professors

Ludwig Bartels, Ph.D.  
Quan "Jason" Cheng, Ph.D.  
Eric L. Chronister, Ph.D.  
Pingyun Feng, Ph.D.  
Cynthia K. Larive, Ph.D.  
Thomas H. Morton, Ph.D.  
Michael Pirrung, Ph.D. *UC Presidential Chair in Chemistry*  
Christopher Y. Switzer, Ph.D.  
Yinsheng Wang, Ph.D.  
Jingsong Zhang, Ph.D.

#### Professors Emeriti

Walter J. Deal, Ph.D.  
Everly B. Fleischer, Ph.D.  
George K. Helmkamp, Ph.D.  
François Mathey, Ph.D.  
M. Mark Midland, Ph.D.  
Robert C. Neuman, Jr., Ph.D.  
William H. Okamura, Ph.D.  
William H. Orttung, Ph.D.  
James N. Pitts, Jr., Ph.D.  
Michael F. Rettig, Ph.D.  
Donald T. Sawyer, Ph.D.  
Hartland H. Schmidt, Ph.D.  
Gary W. Scott, Ph.D.  
Charles L. Wilkins, Ph.D.  
Richard M. Wing, Ph.D.

**Associate Professors**

Christopher J. Bardeen, Ph.D.  
 Jack Eichler, Ph.D.  
 Ryan Julian, Ph.D.  
 Michael J. Marsella, Ph.D.  
 Leonard J. Mueller, Ph.D.  
 Yadong Yin, Ph.D.

**Assistant Professors**

Gregory J.O. Beran, Ph.D.  
 Chia-en Chang, Ph.D.  
 Richard Hooley, Ph.D.  
 Catharine Larsen, Ph.D.  
 Wenwan Zhong, Ph.D.

\*\*

**Cooperating Faculty**

Russ Hille, Ph.D. (Biochemistry)  
 Mihri Ozkan, Ph.D. (Electrical Engineering)  
 Valentine Vullev, Ph.D. (Bioengineering)  
 Paul J. Ziemann, Ph.D. (Environmental Sciences)

**Major**

The Department of Chemistry offers a B.S. and B.A. degree in Chemistry and a B.S. in Chemistry with a Chemical Physics option or an Environmental Chemistry option.

The B.S. program is certified by the American Chemical Society and is designed for students interested in a professionally oriented major leading most often to a career or advanced study in chemistry.

The B.A. program is designed for students who wish to obtain a broad educational background with less intensive emphasis on chemistry. In this program, students have increased ease in meeting requirements for such areas as pre-medical, pre-dental, or prepharmaceutical science; education; and administration. Check [www.careers.ucr.edu](http://www.careers.ucr.edu).

A **Chemical Physics** option is available for students who wish to prepare for admission to a graduate program in chemical physics.

The **Environmental Chemistry** option is available for students who wish to become familiar with environmental processes and problems related to air, water, and soil, and to apply their chemical knowledge working in environmental-related areas. This option also prepares students for admission to a graduate program emphasizing environmental chemistry.

**Pre-Health Science Chemistry** majors in either the B.S. or B.A. programs can prepare for admission to medical, pharmacy, or dental schools by carefully planning their programs of study. Students planning to apply for post-graduate studies in the health sciences should make it a special point to consult with their Chemistry advisor early in their studies at UCR. Check [www.mhcp.ucr.edu](http://www.mhcp.ucr.edu).

**Teaching Credential**

Teachers in the public schools in California must have a credential approved by the State Commission on Teacher Credentialing. The credential requires an undergraduate major, baccalaureate degree, and completion of a graduate credential program such as that offered by the Graduate School of Education at UCR (see Education in this catalog and [www.education.ucr.edu](http://www.education.ucr.edu)).

UCR has an approved undergraduate program for Chemistry majors who plan to get a Multiple Subjects Credential and teach in the elementary (K-6) grades. A breadth of course work is necessary, in addition to the specified requirements for the major. Students are urged to start early, preferably as freshmen, selecting courses most helpful for this career. Details and counseling on the Bridge to Teaching Program, a preparation program for the multiple subjects credential, are available in the Office of Interdisciplinary Programs, 3111 Interdisciplinary Building South (INTS), (951) 827-1584; [www.isnid.ucr.edu](http://www.isnid.ucr.edu). Details and counseling on other programs are available in the Graduate School of Education and [www.education.ucr.edu/programs.html](http://www.education.ucr.edu/programs.html).

UCR does not yet have a state-approved undergraduate program for chemistry majors who wish to teach at the secondary level. The Teaching Credential in Science, chemistry emphasis, is required for chemistry teachers, grades 7-12. Students who plan to get this credential must take the commission's subject-matter assessment examination and should make certain their academic program includes preparatory course work. The examination includes chemistry in depth and general science with introductory, college-level biology, chemistry, physics, and geoscience (geology, meteorology, oceanography, astronomy). Further information about courses, requirements, and examinations can be obtained in orientation meetings and the Graduate School of Education (1124 Sproul Hall).

**California Teach-Science/Mathematics Initiative (CaTEACH-SMI)**

California Teach-Science Mathematics Initiative (CaTEACH-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics. CaTEACH-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the SMI & Alpha Center Apprentice Programs, to explore STEM teaching as a career option. Through CaTEACH-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CaTEACH-SMI Resource Center provides future STEM teachers with material and financial resources which includes the National Science Foundation (NSF) Noyce Scholarship Program to promote planning and professional development towards a science/mathematics education career. For more information about the CaTEACH-SMI program, please visit <http://smi.ucr.edu> or at the Resource Center at 1315 Pierce Hall, (951) 827-4970.

**Transfer Students**

Students transferring to the Chemistry major must complete courses comparable to the following one-year sequences before they transfer:

1. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, each course completed with a grade of "C" or better
2. First-year calculus, equivalent to MATH 009A, MATH 009B, MATH 009C, each course completed with a grade of "C" or better

At least one of the following one-year sequences:

1. General physics (calculus-based) equivalent to PHYS 040A, PHYS 040B, PHYS 040C, each course completed with a grade of "C" or better (strongly recommended)
2. Second-year calculus, equivalent to MATH 010A, MATH 010B, MATH 046, each course completed with a grade of "C" or better
3. Organic chemistry (one-year lower-division), each course completed with a grade of "B" or better

Students must have a minimum grade point average of 2.70 in transferable college courses. UCR has articulation agreements with most of the California community colleges. These agreements list specific community college courses that have been designated as comparable to UCR courses (see the statewide articulation web site at [www.assist.org](http://www.assist.org)). Transfer students will usually find it advantageous to complete most or all sequences before starting at UCR. All prospective transfers should try to complete the sequences they begin rather than divide a sequence between two campuses.

**University Requirements**

See Undergraduate Studies section.

**College Requirements**

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a professional academic advisor at the CNAS Advising Center, 1223 Pierce Hall.

**Major Requirements**

The major requirements for the B.A. and the B.S. degree in Chemistry are as follows:

**Bachelor of Arts**

1. Lower-division requirements (51-52 units)
  - a) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC), CHEM 005
  - b) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A
  - c) PHYS 040A, PHYS 040B, PHYS 040C (or PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC)

2. Upper-division requirements (38-48 units)  
A minimum grade of "C-" for any upper-division course used to fulfill the requirements for the B.A. degree.

a) CHEM 110A, CHEM 110B, CHEM 112A, CHEM 112B, CHEM 112C, CHEM 113, CHEM 125, CHEM 150A, CHEM 191, and either CHEM 111 or CHEM 166

b) Ten (10) additional upper-division units in Chemistry if the year of organic chemistry is taken at a community college

### Bachelor of Science

1. Lower-division requirements (59-60 units)

a) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC), CHEM 005

b) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046

c) PHYS 040A, PHYS 040B, PHYS 040C

2. Upper-division requirements (53-54 units)  
A minimum grade of "C-" for any upper-division course used to fulfill the requirements for the B.S. degree.

a) CHEM 110A, CHEM 110B, CHEM 111, CHEM 112A, CHEM 112B, CHEM 112C, CHEM 113, CHEM 125, CHEM 150A, CHEM 191

b) Two laboratory courses from CHEM 114 or CHEM 140, CHEM 166, BCH 102

c) One course from BCH 100, BCH 110A, CHEM 143

d) One 4-unit course from CHEM 135/ENSC 135/ENTX 135, CHEM 136/ENSC 136/ENTX 136/SWSC 136, CHEM 150B, CHEM 197, CHEM 199. CHEM 197 and CHEM 199 must be taken for a grade and a written report submitted.

### Chemical Physics Option

Students must consult with their Chemistry advisor before electing this option.

1. Lower-division requirements (67-69 units)

a) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC), CHEM 005

b) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046

c) PHYS 041A, PHYS 041B, PHYS 41C or PHYS 040A, PHYS 040B, PHYS 040C, and PHYS 041C

2. Upper-division requirements (72 units)  
A minimum grade of "C-" for any upper-division course used to fulfill the requirements for the Chemical Physics option.

a) CHEM 110A, CHEM 110B, CHEM 111, CHEM 112A, CHEM 112B, CHEM 112C, CHEM 113, CHEM 140, CHEM 150A, CHEM 150B, CHEM 191

b) Twenty-one (21) units of upper-division course work in Mathematics or Physics (110 or above excluding 190 series)

c) Nine (9) additional units in physical chemistry

### Environmental Chemistry Option

Students must consult with their Chemistry advisor before electing this option.

1. Lower-division requirements (72-73 units)

a) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC), CHEM 005

b) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046

c) PHYS 040A, PHYS 040B, PHYS 040C

d) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C

2. Upper-division requirements (73-75 units)

A minimum grade of "C-" for any upper-division course used to fulfill the requirements for the Environmental Chemistry option.

a) CHEM 110A, CHEM 110B, CHEM 111, CHEM 112A, CHEM 112B, CHEM 112C, CHEM 113, CHEM 125, CHEM 135/ENSC 135/ENTX 135, CHEM 136/ENSC 136/ENTX 136/SWSC 136, CHEM 114 or CHEM 140, CHEM 150A, CHEM 166, CHEM 191

b) One course from ENSC 104/SWSC 104 or GEO 137

c) One course from BCH 100, BCH 110A or CHEM 143

d) Two additional courses from CHEM 150B, CHEM 197, CHEM 199, ENSC 100, ENSC 101, ENSC 102, ENSC 104/SWSC 104, ENSC 140/SWSC 140, ENSC 142, ENSC 155, ENSC 163, ENTX 101, GEO 132, GEO 137, GEO 157 (4 units total from CHEM 197 and/or CHEM 199)

**Undergraduate Research** is strongly encouraged for students with the requisite ability. Students wishing to participate in this activity should consult Chemistry faculty, their Chemistry advisor, or check: [or.ucr.edu/undergradresearch/](http://or.ucr.edu/undergradresearch/)

### Sample Program

Student programs are planned on an individual basis with their advisors, and there is considerable flexibility in the sequence in which courses required for the major are taken. For example, PHYS 040A, PHYS 040B, PHYS 040C can be started equally well during either the freshman or sophomore year. The sample program is typical for a well-prepared entering freshman who seeks the B.S. degree.

Freshman Year	Fall	Winter	Spring
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC)	4,1	4,1	4,1
PHYS 040A, PHYS 040B		5	5
MATH 008B or MATH 009A, MATH 009B, MATH 009C	4	4	4
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4

Elective (optional)	4		
Total Units	17	18	18

### Sophomore Year

CHEM 112A, CHEM 112B, CHEM 112C	4	4	4
PHYS 040C	5		
MATH 010A, MATH 010B, MATH 046	4	4	4
CHEM 005		5	
Electives		4	8
Total Units	13	17	16

### Junior Year

CHEM 110A, CHEM 110B, CHEM 113	4	4	4
Biological Science w/Lab			
CHEM 150A, CHEM 150B	4	4	4
CHEM 125	5		
CHEM 143		3	
CHEM 191			1
Electives	4	4	8
Total Units	17	15	17

### Senior Year

CHEM 111, CHEM 140		4	4
CHEM 166			4
Electives	12	8	4
Total Units	12	12	12

## Minor

The minor in Chemistry consists of 28 upper-division units in chemistry.

- Of the specified upper-division units, a minimum of 16 units must be unique to the minor and may not be used to satisfy major requirements.
- At least one of the courses used to satisfy the 28 units must be in CHEM 125, CHEM 111, CHEM 140 or CHEM 166 (courses which include laboratory work).
- No more than 4 units of 190-199 courses may be used in fulfilling the upper-division units for a minor.

All of the upper-division courses in chemistry have a prerequisite of CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC and most have CHEM 005 as a prerequisite.

Students with a minor in Chemistry should consult with their Chemistry advisor to construct a specific program consistent with their career goals.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Graduate Program

The Chemistry Department offers the M.S. and Ph.D. degrees in Chemistry.

Fields of specialization (subdisciplines) are analytical chemistry, inorganic chemistry, organic chemistry, and physical chemistry. Research is also carried out in bioanalytical, bioinorganic, bioorganic, and biophysical chemistry and in chemical physics, environmental/atmospheric, organometallic chemistry, and neuroscience. For additional information

on the latter, please see Neuroscience Graduate Program in the Programs and Courses section of this catalog.

**Admission** All applicants must submit scores from the GRE General Test. A score from the Advanced Chemistry GRE is not required for admission. It is strongly recommended, however, that applicants submit this score in order to receive maximum consideration for fellowships. The department normally considers applications for teaching and research assistantships at the same time as fellowships; therefore, students are strongly encouraged to complete their applications for admission and support as early as possible. Normally applications for fellowships are awarded by February for students entering in the following fall quarter. Although most students begin in the fall quarter, students may begin their studies in the winter or spring quarter.

**Orientation Examinations** Admitted students must, at the beginning of their first quarter in residence, take orientation examinations. The examinations are normally given during two consecutive days starting up to one week prior to the first day of instruction. Although a notice of the times and places of these examinations is sent to each student admitted to regular graduate status in chemistry, it is the student's responsibility to be on the campus early enough to check the bulletin boards in Chemical Sciences for this information. Students take these examinations in the four subdisciplines: analytical, inorganic, organic, and physical chemistry. The purpose of these examinations is to assess the student's undergraduate preparation. The results permit the faculty to determine the course program that will most effectively aid the students' development in their chosen subdisciplines.

## Master's Degree

The Department of Chemistry offers the M.S. degree in Chemistry.

Requirements are:

1. Satisfactory performance in orientation examinations in analytical, inorganic, organic, and physical chemistry
2. General university requirements and departmental requirements for either Plan I or Plan II.

**Plan I (Thesis)** Students must take at least 36 units of approved courses and graduate research of which five regular lecture courses in the CHEM 200-249 series (CHEM 110A or CHEM 110B, CHEM 113, CHEM 125, and CHEM 150A or CHEM 150B may apply under certain circumstances). A maximum of 12 units of seminar courses (CHEM 250-259) and a maximum of 12 units of graduate research; (but not those numbered CHEM 260-289) may apply towards the 36 units. Students must complete a thesis, and a final oral examination on the thesis may be required.

**Plan II (Comprehensive Examination)** Students must complete at least 36 units of approved courses of which at least 18 must be in regular

lecture courses numbered CHEM 200-249 (CHEM 110A or CHEM 110B, CHEM 113, CHEM 125, and CHEM 150A or CHEM 150B may apply under certain circumstances) and up to 12 units of graduate seminar courses numbered CHEM 250-259. Those numbered CHEM 260-289 are specifically excluded.

## Doctoral Degree

The Department of Chemistry offers the Ph.D. degree in Chemistry.

The requirements are orientation examinations in analytical, inorganic, organic, and physical chemistry; general university requirements; and departmental requirements.

**Program of Study** The departmental committee on graduate study determines a program of study on the basis of the students' performance on the orientation examinations and a consideration of their subdisciplines. For students with a normal B.S. level preparation, the typical course pattern for each subdiscipline is as follows:

1. Analytical (a minimum of three courses selected from CHEM 221A, CHEM 221B, CHEM 221C, CHEM 221D, CHEM 221E plus two other courses)
2. Inorganic (CHEM 231A, CHEM 231B, CHEM 231C plus two other courses)
3. Organic (CHEM 211A, CHEM 211B, CHEM 211C plus two other courses)
4. Physical (a minimum of three courses selected from CHEM 201A, CHEM 201B, CHEM 201C, CHEM 201D, CHEM 201E plus two other courses)

**Second Year Research Evaluation** Students seeking advancement to candidacy for the Ph.D. degree must undergo a Second-Year Research Evaluation (SYRE). The SYRE must take place by the end of the student's fourth academic quarter of residency and is administered by a four-member committee of the Chemistry faculty, one of whom is the student's dissertation advisor. The Chair of the SYRE Committee will be someone other than the dissertation advisor. Typically, these same four faculty members would also serve on the oral qualifying examination committee, with the Chair of the SYRE Committee continuing on as Chair of the oral qualifying examination committee.

The SYRE consists of both a written and oral component and the student is assessed on both components. The written SYRE document should provide an introduction to the dissertation research, an outline of the goals and objectives, a description of the progress to date, and a delineation of the path forward. The SYRE document is limited to five single-spaced pages (12-point type), excluding references. The oral component of the SYRE will be a presentation of the written document. After presentation of the SYRE document, the student will be queried by committee to assess the student's general knowledge of the material. A student will receive a single grade of Pass, Qualified Pass, or Fail. A Pass signifies that the student has made satisfactory progress in research and is on track to pass the oral qualify-

ing examination. A Qualified Pass signifies that a student's progress in research is reasonable, but that improvement is needed, and should be demonstrated at the time of the oral qualifying examination. A Fail signifies that a student has to date, not made satisfactory progress in research. A student who fails the SYRE would not be required to undergo a second evaluation; however, such students would be placed on notice that they are not on track to pass the oral qualifying examination unless major steps are taken to correct serious deficiencies in research performance.

**Foreign Language Requirement** A reading knowledge of German, French, or Russian is recommended but not required.

**Oral Qualifying Examination** This examination consists in part of defending an original proposition and is designed to test the extent of the candidates' development and their breadth of knowledge in chemistry and related fields.

**Teaching Requirement** Normally requires three quarters of service as a teaching assistant, or equivalent.

**Normative Time to Degree** 15 quarters

## Lower-Division Courses

### CHEM 001A. General Chemistry (4) F, W, Summer

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): a score of 3, 4, or 5 on the College Board Advanced Placement Chemistry Examination or a passing score on the California Chemistry Diagnostic Test or a grade of "C-" or better in MATH 005 or concurrent enrollment in MATH 008B or a grade of "C-" or better in MATH 008B or a grade of "C-" or better in an equivalent college-level mathematics or chemistry course; concurrent enrollment in CHEM 01LA or a grade of "C-" or better in CHEM 01LA. An introduction to the basic principles of chemistry. Credit is awarded for only one of CHEM 001A or CHEM 01HA.

### CHEM 001B. General Chemistry (4) W, S, Summer

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): grades of "C-" or better in CHEM 001A and CHEM 01LA or grades of "C-" or better in CHEM 01HA and CHEM 1HLA; concurrent enrollment in CHEM 01LB or a grade of "C-" or better in CHEM 01LB. An introduction to the basic principles of chemistry. Credit is awarded for only one of CHEM 001B or CHEM 01HB.

### CHEM 001C. General Chemistry (4) F, S, Summer

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): grades of "C-" or better in CHEM 001B and CHEM 01LB or grades of "C-" or better in CHEM 01HB and CHEM 1HLB; concurrent enrollment in CHEM 01LC or a grade of "C-" or better in CHEM 01LC. An introduction to the basic principles of chemistry. Credit is awarded for only one of CHEM 001C or CHEM 01HC.

### CHEM 001W. Preparation for General Chemistry (3) F

Lecture, 2 hours; workshop, 3 hours. Prerequisite(s): completion of or concurrent enrollment in MATH 005 or MATH 008A. For students who are not prepared or qualified for admission to CHEM 001A. Instruction and practice in concept manipulation and problem solving to prepare students to master material in CHEM 001A. Concurrent enrollment in CHEM 001A is not allowed. Not open to students who have completed CHEM 001A with a grade of "C-" or better. Counts toward the 180-unit graduation requirement for the baccalaureate degree but does not satisfy any major or college breadth requirements. Graded Satisfactory (S) or No Credit (NC).

**CHEM 01HA. Honors General Chemistry (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): completion of or concurrent enrollment in MATH 009A or MATH 09HA or equivalent or Advanced Placement (AP) chemistry credit or AP calculus credit or AP physics credit; a score of 640 or higher on the mathematics portion of the SAT Reasoning Test or a score of 28 or higher on the ACT Mathematics Test; high school chemistry; or consent of instructor; concurrent enrollment in CHEM 1HLA or a grade of "B" or better in CHEM 1HLA. Honors course corresponding to CHEM 001A. A limited enrollment course in which the principles of chemistry are covered in more depth than in CHEM 001A. Credit is awarded for only one of CHEM 001A or CHEM 01HA.

**CHEM 01HB. Honors General Chemistry (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): grades of "B" or better in CHEM 001A and CHEM 01LA or grades of "B" or better in CHEM 01HA and CHEM 1HLA or consent of instructor; concurrent enrollment in CHEM 1HLB or a grade of "B" or better in CHEM 1HLB. Honors course corresponding to CHEM 001B. A limited enrollment course in which the principles of chemistry are covered in more depth than in CHEM 001B. Credit is awarded for only one of CHEM 001B or CHEM 01HB.

**CHEM 01HC. Honors General Chemistry (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): grades of "B" or better in CHEM 001B and CHEM 01LB or grades of "B" or better in CHEM 01HB and CHEM 1HLB or consent of instructor; concurrent enrollment in CHEM 1HLC or a grade of "B" or better in CHEM 1HLC. Honors course corresponding to CHEM 001C. A limited enrollment course in which the principles of chemistry are covered in more depth than in CHEM 001C. Credit is awarded for only one of CHEM 001C or CHEM 01HC.

**CHEM 1HLA. Honors General Chemistry Laboratory (1) F, W, Summer** Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 01HA or a grade of "B" or better in CHEM 01HA. Honors course corresponding to CHEM 01LA. An introduction to laboratory principles and techniques related to lecture topics in CHEM 01HA. Credit is awarded for only one of CHEM 01LA or CHEM 1HLA.

**CHEM 1HLB. Honors General Chemistry Laboratory (1) W, S, Summer** Laboratory, 3 hours. Prerequisite(s): grades of "B" or better in CHEM 001A and CHEM 01LA or grades of "B" or better in CHEM 01HA and CHEM 1HLA; concurrent enrollment in CHEM 01HB or a grade of "B" or better in CHEM 01HB. Honors course corresponding to CHEM 01LB. An introduction to laboratory principles and techniques related to lecture topics in CHEM 01HB. Credit is awarded for only one of CHEM 01LB or CHEM 1HLB.

**CHEM 1HLC. Honors General Chemistry Laboratory (1) F, S, Summer** Laboratory, 3 hours. Prerequisite(s): grades of "B" or better in CHEM 001B and CHEM 01LB or grades of "B" or better in CHEM 01HB and CHEM 1HLB; concurrent enrollment in CHEM 01HC or a grade of "B" or better in CHEM 01HC. Honors course corresponding to CHEM 01LC. An introduction to laboratory principles and techniques related to lecture topics in CHEM 01HC. Credit is awarded for only one of CHEM 01LC or CHEM 1HLC.

**CHEM 01LA. General Chemistry Laboratory (1) F, W, Summer** Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 001A or a grade of "C-" or better in CHEM 001A. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001A. Credit is awarded for only one of CHEM 01LA or CHEM 1HLA.

**CHEM 01LB. General Chemistry Laboratory (1) W, S, Summer** Laboratory, 3 hours. Prerequisite(s): grades of "C-" or better in CHEM 001A and CHEM 01LA or grades of "C-" or better in CHEM 01HA and CHEM 1HLA; concurrent enrollment in CHEM 001B or a grade of "C-" or better in CHEM 001B. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001B. Credit is awarded for only one of CHEM 01LB or CHEM 1HLB.

**CHEM 01LC. General Chemistry Laboratory (1) F, S, Summer** Laboratory, 3 hours. Prerequisite(s): grades of "C-" or better in CHEM 001B and CHEM 01LB or grades of "C-" or better in CHEM 01HB and CHEM 1HLB; concurrent enrollment in CHEM 001C or a grade of "C-" or better in CHEM 001C. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001C. Credit is awarded for only one of CHEM 01LC or CHEM 1HLC.

**CHEM 003. Concepts of Chemistry (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of basic concepts of Chemistry. Designed for non-science majors and not as preparation for CHEM 001A or CHEM 01HA. Not open to students with credit for CHEM 001A or CHEM 01HA, but students who have completed CHEM 003 may take CHEM 001A or CHEM 01HA for full credit.

**CHEM 005. Quantitative Analysis (5) W** Lecture, 3 hours; laboratory, 8 hours. Prerequisite(s): CHEM 001C and CHEM 01LC with grades of "C-" or better or CHEM 01HC and CHEM 1HLC with grades of "C-" or better. Stoichiometric calculations and applications of principles of chemical equilibrium to analytical problems. Includes titrimetric and gravimetric laboratory procedures.

**CHEM 091. Freshman Seminar: What Chemists Do (1)** Seminar, 1 hour. Explores the frontiers of chemistry (analytical, inorganic, organic, and physical) as well as the role of chemistry in allied areas such as agriculture, biology, environmental science, forensics, materials, medicine, and neuroscience. Graded Satisfactory (S) or No Credit (NC).

**CHEM 097H. Freshman Honors Project: Introduction to Research (1-4)** Outside research, 3-12 hours. Prerequisite(s): admission to the University Honors Program. Prior arrangement with a chemistry faculty member is required. An introduction to the methods of research in chemical sciences. The student conducts an investigation under the supervision of a faculty member. A written report is required at the end of the quarter. To satisfy the requirement for the University Honors Program Freshman Project, the student must earn a minimum of 4 units during the first year. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable.

## Upper-Division Courses

**CHEM 109. Survey of Physical Chemistry (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C and CHEM 01LC with grades of "C-" or better or CHEM 01HC and CHEM 1HLC with grades of "C-" or better; MATH 009B with a grade of "C-" or better or MATH 09HB with a grade of "C-" or better. Introduces thermodynamics, chemical equilibrium, kinetics, quantum chemistry, atomic and molecular structure, and spectroscopy. Primarily for students with major interests in life and agricultural sciences; not recommended for Chemistry majors. Credit is not awarded for CHEM 109 if it has already been awarded for CHEM 110A or CHEM 110B.

**CHEM 110A. Physical Chemistry: Chemical Thermodynamics (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C and CHEM 01LC

with grades of "C-" or better or CHEM 01HC and CHEM 1HLC with grades of "C-" or better; MATH 010A with a grade of "C-" or better (or if MATH 010A is taken concurrently, MATH 009C with a grade of "C-" or better or MATH 09HC with a grade of "C-" or better); PHYS 002C with a grade of "C-" or better or PHYS 040C with a grade of "C-" or better (PHYS 040C may be taken concurrently); or consent of instructor. An introduction to thermodynamics, with applications to chemical systems.

**CHEM 110B. Physical Chemistry: Introduction to Statistical Mechanics and Kinetics (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 110A with a grade of "C-" or better or consent of instructor; prior or concurrent enrollment in MATH 010B is recommended. Statistical mechanics, kinetic molecular theory, and chemical kinetics with applications to chemical systems.

**CHEM 111. Physical Chemistry Laboratory (4) W** Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C-" or better (CHEM 110B may be taken concurrently), or consent of instructor. CHEM 113 recommended. Physical chemical measurements and laboratory experiments illustrating fundamental principles of physical chemistry. Modern electronic and optical measurement techniques.

**CHEM 112A. Organic Chemistry (4) F, W, Summer** Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): CHEM 001C and CHEM 01LC with grades of "C-" or better or CHEM 01HC and CHEM 1HLC with grades of "C-" or better. Covers modern organic chemistry including structure, nomenclature, reactivity, synthesis, and reaction mechanisms and the chemistry of carbohydrates, lipids, nucleic acids, amino acids, and proteins. Also includes laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis.

**CHEM 112B. Organic Chemistry (4) W, S, Summer** Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): CHEM 112A with a grade of "C-" or better. Covers modern organic chemistry including structure, nomenclature, reactivity, synthesis, and reaction mechanisms and the chemistry of carbohydrates, lipids, nucleic acids, amino acids, and proteins. Also includes laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis.

**CHEM 112C. Organic Chemistry (4) F, S, Summer** Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): CHEM 112B with a grade of "C-" or better. Covers modern organic chemistry including structure, nomenclature, reactivity, synthesis, and reaction mechanisms and the chemistry of carbohydrates, lipids, nucleic acids, amino acids, and proteins. Also includes laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis.

**CHEM 113. Physical Chemistry: Introduction to Quantum Chemistry (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C and CHEM 01LC with grades of "C-" or better or CHEM 01HC and CHEM 1HLC with grades of "C-" or better; MATH 009C with a grade of "C-" or better or MATH 09HC with a grade of "C-" or better. MATH 046 is recommended. Introduction to quantum mechanics with application to atomic and molecular structure and spectra.

**CHEM 114. Advanced Physical Chemistry Laboratory (4) S** Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): CHEM 111 with a grade of "C-" or better or consent of instructor; completion of or concurrent enrollment in CHEM 113. Involves measurements and laboratory experiments illustrating applications of physical chemistry methods to problems in environ-

mental, materials, and biological chemistry. Covers modern data acquisition, analysis, and computational techniques.

**CHEM 122H. Honors Discussion for Organic Chemistry (1) F** Discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 112A; admission to the University Honors Program or consent of instructor. Involves advanced, in-depth discussions of current literature relevant to the content of CHEM 112A. Students work in small teams to solve advanced problem sets. Satisfactory (S) or No Credit (NC) grading is not available.

**CHEM 123H. Honors Discussion for Organic Chemistry (1) W** Discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 112B; admission to the University Honors Program or consent of instructor. Involves advanced, in-depth discussions of current literature relevant to the content of CHEM 112B. Students work in small teams to solve advanced problem sets. Satisfactory (S) or No Credit (NC) grading is not available.

**CHEM 124. Discussion for Organic Chemistry (1) S** Discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 112C. Involves in-depth discussions of problems relevant to the content of CHEM 112C. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of CHEM 124 or CHEM 124H.

**CHEM 124H. Honors Discussion for Organic Chemistry (1) S** Discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 112C; admission to the University Honors Program or consent of instructor. Honors course corresponding to CHEM 124. Involves advanced, in-depth discussions of current literature relevant to the content of CHEM 112C. Students work in small teams to solve advanced problem sets. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of CHEM 124 or CHEM 124H.

**CHEM 125. Instrumental Methods (3 or 5) F** Lecture, 3 hours; laboratory, 8 hours. Prerequisite(s): CHEM 005 with a grade of "C-" or better; PHYS 002C or PHYS 040C (PHYS 002C or PHYS 040C may be taken concurrently); or equivalents; or consent of instructor. Presents chromatographic separations, electrochemistry, and principles of spectroscopic techniques as an introduction to instrumental methods and their use in chemistry. Graduate students may register for either lecture only (3 units) or for lecture and laboratory (5 units).

**CHEM 135. Chemistry of the Clean and Polluted Atmosphere (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 112A, CHEM 112B, or consent of instructor; ENSC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric NO<sub>x</sub> chemistry; methane oxidation cycle; phase distributions of chemicals; wet and dry deposition; chemistry of volatile organic compounds; formation of photochemical air pollution; modeling of air pollution and control strategies; stratospheric ozone depletion and global warming. Cross-listed with ENSC 135 and ENTX 135. **Ziemann**

**CHEM 136. Chemistry of Natural Waters (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 with a grade of "C-" or better or ENSC 104 /SWSC 104 with a grade of "C-" or better or consent of instructor. Introduction to processes controlling the chemical composition of natural waters. Topics include chemical equilibria, acid-base and coordination chemistry, oxidation-reduction reactions, precipitation-dissolution, air-water exchange, and use of equilibrium and kinetic models for describing marine nutrient, trace metal, and sediment chemistry. Cross-listed with ENSC 136, ENTX 136, and SWSC 136. **Parker**

**CHEM 140. Environmental Chemistry Laboratory (4) S** Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): CHEM 125 with a grade of "C-" or better, CHEM 110A (or CHEM 109) with a grade of "C-" or better; or consent of instructor. Theory and application of chemical techniques for the analysis of environmentally relevant chemical processes. Discusses gas phase, condensed phase, surface, and particulate chemistry. Topics include "acid rain," photochemical smog, ozone depletion, and chemical analysis monitoring.

**CHEM 143. Bioorganic Chemistry (3) S** Lecture, 3 hours. Prerequisite(s): BCH 184 or CHEM 109 or CHEM 110B; CHEM 112C. Discusses biochemical reactions from a chemical standpoint. Includes reactions associated with bioenergetics, biosynthesis, and enzyme catalysis. Emphasizes reaction mechanisms.

**CHEM 150A. Inorganic Chemistry (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 112A, CHEM 112B, CHEM 112C all with grades of "C-" or better; CHEM 110A (or CHEM 109) with a grade of "C-" or better. A systematic introduction to the synthesis, reactions, structure, and bonding of important classes of inorganic compounds. Emphasis on non-transition metal chemistry.

**CHEM 150B. Inorganic Chemistry (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 150A with a grade of "C-" or better. A systematic introduction to synthesis, reactions, structure, and bonding of important classes of inorganic compounds. Emphasis on transition metal chemistry.

**CHEM 166. Advanced Structural and Synthetic Methods (2 or 4) S** Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): CHEM 005 with a grade of "C-" or better or BCH 102 with a grade of "C-" or better; CHEM 112C with a grade of "C-" or better; consent of instructor is required for students enrolling only in the lecture (2 units); CHEM 125 and CHEM 150A are recommended. Enrollment priority is given to students with a grade of "B-" or better in CHEM 112C. Covers methods for the characterization of organic and inorganic compounds and advanced methods of synthesis of organic and inorganic compounds such as vacuum, inert atmosphere, high-pressure, and photochemical techniques. Involves hands-on use of spectroscopic (nuclear magnetic resonance and optical spectroscopy and mass spectrometry) and computer-based methods for structural characterization. Non-Chemistry majors and graduate students may enroll for the lecture (2 units) or for the lecture and laboratory (4 units).

**CHEM 190. Special Studies (1-5)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems.

**CHEM 191. Seminar in Chemistry Careers (1) S** Seminar, 1 hour. Prerequisite(s): upper-division standing. Oral reports and discussions by students, faculty, and visiting speakers. Required of chemistry majors; normally taken in the spring of the junior year. Graded Satisfactory (S) or No Credit (NC).

**CHEM 197. Research for Undergraduates (1-4)** Outside research, 3-12 hours. Prerequisite(s): sophomore or junior standing; consent of instructor. An introduction to the methods of research in chemistry. Includes a research project completed under the supervision of a Chemistry faculty member. Students who submit a written research report receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 6 units.

**CHEM 198-I. Individual Internship (1-12)** Internship, 2-24 hours; term paper or preparation for presentation, 1-12 hours. Prerequisite(s): upper-division standing in chemistry; consent of instructor. Industrial work experience coordinated and supervised by a chemistry fac-

ulty member and an off-campus sponsor. Requires a term paper or presentation. Course is repeatable to a maximum of 12 units.

**CHEM 199. Senior Research (1-4)** Outside research, 3-12 hours. Prerequisite(s): senior standing; consent of instructor. Research project completed under the supervision of a Chemistry faculty member. Students who submit a written research report receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Total credit for CHEM 199 and/or CHEM 199H may not exceed 9 units.

**CHEM 199H. Senior Honors Research (1-5)** Outside research, 3-15 hours. Prerequisite(s): senior standing; consent of instructor; a minimum GPA of 3.00 in chemistry courses and in all university course work. Research in chemistry conducted under the supervision of a Chemistry faculty member. Students who submit a written research report receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Total credit for CHEM 199 and/or CHEM 199H may not exceed 9 units.

## Graduate Courses

**CHEM 201A. Advanced Physical Chemistry: Quantum Mechanics (3)** Lecture, 3 hours. Prerequisite(s): CHEM 113 with a grade of "C" or better. Covers concepts in quantum mechanics including wavepackets, uncertainty, single particles in multiple dimensions, and approximate methods for solving the Schrodinger equation.

**CHEM 201B. Advanced Physical Chemistry: Quantum Mechanics and Spectroscopy (3)** Lecture, 3 hours. Prerequisite(s): CHEM 113 with a grade of "C" or better. Covers concepts in quantum mechanics with particular applications to spectroscopy.

**CHEM 201C. Advanced Physical Chemistry: Elementary Statistical Mechanics (3)** Lecture, 3 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C" or better. Covers concepts in elementary statistical mechanics including ensembles, interpretations of thermodynamic functions, and quantum statistics.

**CHEM 201D. Advanced Physical Chemistry: Thermodynamics (3)** Lecture, 3 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C" or better. Covers concepts in thermodynamics including fundamental equations, potentials, Maxwell relations, and stability criteria. Cross-listed with MSE 205.

**CHEM 201E. Advanced Physical Chemistry: Kinetics (3)** Lecture, 3 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C" or better. Covers concepts in kinetics including reaction mechanisms and the molecular interpretation of reaction dynamics.

**CHEM 202. Advanced Instrument Design (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor; consent of instructor of CHEM 202 or both concurrent enrollment in and consent of instructor of CHEM 297 or both concurrent enrollment in and consent of instructor of CHEM 299. Focuses on the technical aspects of design and manufacture of instrumentation for physical chemistry and related fields. Introduces design and simulation software and provides hands-on experience in the realization of advanced instrumentation development projects. Students who complete a project and take the final examination receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade.

**CHEM 203. Nanoscience and Nanotechnology (3)** Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. Provides a condensed, inter-

disciplinary overview of selected fields of nanoscience and emerging nanotechnological applications. Focuses on applications relevant for the campus research community that are not based on electronic applications of silicon. Cross-listed with MSE 245C.

**CHEM 206A. Introduction to Computational Quantum Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 113 or equivalent, graduate standing; or consent of instructor. Introduces computational techniques in quantum chemistry. Includes Hartree-Fock theory, Density Functional Theory, and electron correlation methods. Emphasizes practical applications in a research setting. Cross-listed with MSE 225C.

**CHEM 206B. Modeling Chemical and Biochemical Molecules (3)** Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry or a related field or consent of instructor. Introduces students to the principles, concepts, and techniques for modeling chemical and biological systems. Covers the various methods and techniques for molecular simulations, energy calculations, obtaining initial data, accessing data reliably, visualization and analysis of molecules, and screening and designing chemicals for proteins.

**CHEM 207. Chemical Group Theory (3)** Lecture, 3 hours. Prerequisite(s): consent of instructor. The principles of group theory and molecular symmetry. Applications in several areas of chemistry.

**CHEM 208. Interdisciplinary Overview of Current Issues in Semiconductor Processing (3)** Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. An interdisciplinary overview of present-day semiconductor processing. Introduces topics such as properties of semiconductors, cleanroom environment, epitaxy, ion implantation, etching, lithography, device architecture, testing, and fault detection. May offer field trips. Cross-listed with MSE 245D and PHYS 202. **Bartels**

**CHEM 209 (E-Z). Advanced Topics in Physical Chemistry (2-3)** lecture, 2 hours (2 units) or 3 hours (3 units). Prerequisite(s): consent of instructor. Additional prerequisites are required for some segments of this course; see department. Selected advanced topics from modern physical chemistry.

**CHEM 210. Advanced Organic Reactions (3)** Lecture, 3 hours. Prerequisite(s): CHEM 112C. Covers modern organic reactions and reagents and their mechanistic pathways. Emphasizes recent developments. Cross-listed with MSE 245A.

**CHEM 211A. Advanced Organic Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 112C, CHEM 113. Covers structure and bonding in organic compounds, with emphasis on more advanced aspects of the field.

**CHEM 211B. Advanced Organic Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 112C, CHEM 113. Covers the kinetics and mechanism of organic reactions, with emphasis on more advanced aspects of the field.

**CHEM 211C. Advanced Organic Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 112C, CHEM 113. Covers synthetic organic chemistry, with emphasis on more advanced aspects of the field.

**CHEM 215A. Organic Synthesis (3)** Lecture, 3 hours. Prerequisite(s): CHEM 211A, CHEM 211B, CHEM 211C. An advanced treatment of synthetic organic chemistry. CHEM 215A is not a prerequisite to CHEM 215B.

**CHEM 215B. Organic Synthesis (3)** Lecture, 3 hours. Prerequisite(s): CHEM 211A, CHEM 211B, CHEM 211C. An advanced treatment of synthetic organic chemistry. CHEM 215A is not a prerequisite to CHEM 215B.

**CHEM 216A. Physical Organic Chemistry: Organic Structure Analysis (3)** Lecture, 3 hours. Prerequisite(s): CHEM 211A, CHEM 211B, CHEM 211C. Utilizes modern spectroscopic techniques such as IR, mass spectrometry, and  $^1\text{H}$  and  $^{13}\text{C}$  NMR to determine the structure of complex organic molecules. Topics include advanced NMR techniques such as 2D NMR, NMR pulse sequences, diffusion NMR, and MRI. Cross-listed with MSE 225A.

**CHEM 216B. Physical Organic Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 211A, CHEM 211B, CHEM 211C. An advanced treatment of physical organic chemistry.

**CHEM 217. Polymers: Synthesis and Characterization (3)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing in Biochemistry and Molecular Biology, Chemistry, Chemical and Environmental Engineering, Chemistry, Electrical Engineering, Mechanical Engineering, or Physics or consent of instructor. Introduces fundamentals of polymer synthesis, types of polymers, stereo architectures, and applications. Explores modern methods of synthesis, emphasizing catalytic methods. Describes industrial synthetic methods. Examines polymer physics and characterization, emphasizing physical methods.

**CHEM 221A. Advanced Analytical Chemistry: Separation Science (3)** Lecture, 3 hours. Prerequisite(s): CHEM 125. Provides an overview of modern analytical separations including theory, instrumentation, and applications.

**CHEM 221B. Advanced Analytical Chemistry: Optical Spectroscopy (3)** Lecture, 3 hours. Prerequisite(s): CHEM 125. Provides an overview of modern analytical optical spectroscopic techniques including theory, instrumentation, and applications. Cross-listed with MSE 225B.

**CHEM 221C. Advanced Analytical Chemistry: Electrochemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 125. Provides an overview of modern electrochemistry including basic theory, applications, and instrumentation of potentiometry and amperometry.

**CHEM 221D. Advanced Analytical Chemistry: Mass Spectroscopy (3)** Lecture, 3 hours. Prerequisite(s): CHEM 125. Provides an overview of modern mass spectroscopy including basic theory, instrumentation, and applications. Focus is on biological applications.

**CHEM 221E. Advanced Analytical Chemistry: Introduction to Bioanalytical Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 125. Covers important aspects of modern chemical measurements, with particular emphasis on bioanalysis. Discusses analytical challenges associated with drug discovery and development, including analysis of combinatorial libraries, high-throughput screening, metabonomics, genomics, and proteomics, as well as new developments in analytical methods and instrumentation.

**CHEM 223. Nature of the Chemical Bond (3)** Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry or a related field or consent of instructor. Explores all aspects of chemical bonding including molecular orbital theory, valence bond theory, and noncovalent bonding, with coverage of key concepts from all subdivisions of chemistry.

**CHEM 229 (E-Z). Advanced Topics in Analytical Chemistry (2 or 3)** Lecture, 2-3 hours. Prerequisite(s): consent of instructor. Additional prerequisites may be required for segments of this course; see department. Selected advanced topics from modern analytical chemistry. Course content will vary.

**CHEM 231A. Structure and Bonding in Inorganic Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 150A, CHEM 150B. Covers advanced synthesis, structure, and bonding in inorganic, coordination, and organometallic chemistry. Cross-listed with MSE 245B.

**CHEM 231B. Reactivity and Mechanism in Inorganic and Organometallic Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 231A/MSE 245B. Covers advanced synthesis, reactivity, and mechanism in inorganic, coordination, and organometallic chemistry.

**CHEM 231C. Solid State and Materials in Inorganic Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 231A/MSE 245B. Covers the advanced synthesis, structure, bonding, and properties of inorganic materials.

**CHEM 239 (E-Z). Advanced Topics in Inorganic Chemistry (2-3)** lecture, 2 hours (2 units) or 3 hours (3 units). Prerequisite(s): graduate standing. Prerequisites are required for some segments of this course; see department. Covers selected advanced topics in modern inorganic chemistry. The contents of the segments vary.

**CHEM 242. Combinatorial Chemistry and Chemical Genomics (3)** Lecture, 3 hours. Prerequisite(s): BIOL 102, CHEM 112C, or equivalents; a passing grade on the Chemistry Department organic orientation examination. Explores topics in chemical genomics. Part I of the course involves combinatorial principles, library methods, solid-phase and split-pool synthesis, deconvolution, library design and informatics, and parallel synthesis. Part II involves screening and selection systems, forward and reverse chemical genetic approaches, phenocopies and epistasis, preparation and use of molecular arrays, and target identification. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CHEM 245. Chemistry and Physics of Aerosols (3)** Lecture, 3 hours. Prerequisite(s): CHEM 109, CHEM 110B; or consent of instructor. Fundamentals of chemical and physical processes controlling behavior and properties of airborne particles. Topics include particle mechanics; electrical, optical, and thermodynamic properties; nucleation; surface and aqueous-phase chemistry; gas particle partitioning; sampling; size and chemical analysis; atmospheric aerosols; and environmental effects. Cross-listed with ENTX 245 and SWSC 245.

**CHEM 246. Fate and Transport of Chemicals in the Environment (4)** Lecture, 4 hours. Prerequisite(s): CHEM 109 or CHEM 110B; CHEM 112A, CHEM 112B, CHEM 112C; or consent of instructor. Covers the identification of toxicants and their sources in the environment; equilibrium partitioning of chemicals in the environment (between air, water, soil, sediment, and biota) using physico-chemical properties; and the transport and chemical transformations of chemical compounds in air, water, and soil media. Includes case studies of fate and transport of selected toxic chemicals. Cross-listed with ENSC 200 and ENTX 200.

**CHEM 250. Graduate Seminar in Chemistry (1)** Seminar, 1.5 hours. Prerequisite(s): graduate standing. Oral reports by graduate students, faculty, and visiting scholars on current research topics in chemistry. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CHEM 251. Graduate Seminar in Analytical Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate student status. Oral reports and discussion by students, faculty, and visiting scholars on current research topics in analytical chemistry. The course is offered each quarter. Students who present a seminar

receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 252. Graduate Seminar in Inorganic Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate student status. Oral reports and discussion by students, faculty, and visiting scholars on current research topics in inorganic chemistry. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 253. Graduate Seminar in Organic Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate student status. Oral reports and discussion by students, faculty, and visiting scholars on current research topics in organic chemistry. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 254. Graduate Seminar in Physical Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate student status. Oral reports and discussion by students, faculty, and visiting scholars on current research topics in physical chemistry. The course is offered each quarter. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 256. Chemistry of Nanostructured Materials (2)** Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Explores the chemistry of nanostructured materials. Introduces nanotechnology, solid state chemistry and physics of nanomaterials, nanoscale characterization tools, lithography, micro- and nanofabrication, physical and chemical methods to nanomaterials, surface modification, sol-gel chemistry, self assembly at various length scales, and bio-inspired materials. Emphasis is on development of novel functional nanostructured materials through chemical synthesis, surface modification, and self-assembly. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Yin**

**CHEM 258. Seminar in Surface Science (1)** Seminar, 1 hour. Prerequisite(s): graduate standing in Physics or Chemistry or consent of instructor. Oral presentations by participating visiting scholars, postdoctoral researchers, students, and UCR faculty on current research topics in surface science. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with PHYS 258. **Zaera**

**CHEM 259. Bioanalytical Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Explores bioanalytical separation and detection techniques. Topics include liquid chromatography, capillary electrophoresis, field flow fractionation, flow cytometry, multidimensional or multiplexed chromatography, microfluidics, mass spectrometry, biological sample preparation, and biosensors. Emphasis is on development of new bioanalytical techniques for detection of pathogens and study of pathogen-host interactions. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Zhong**

**CHEM 261. Scanning Probe Microscopy in Surface Science (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on theory and applications of scanning probe microscopy in surface science, including the use of scanning tunneling microscopy to image surfaces on the atomic and

molecular length scale, and scanning probe techniques to investigate and control elementary steps of surface reactions. Reviews surface crystallography, electronic, and phononic band structure. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Bartels**

**CHEM 262. Ultrafast Dynamics in Condensed Matter (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. The extremely fast relaxation and dephasing of nuclear (vibrational) and electronic excitations in condensed matter are probed by the use of coherent spectroscopy using (sub-picosecond) light pulses. Decay mechanisms are studied by making spectroscopic measurements at cryogenic temperatures (approximately 1K) and at various high pressures (greater than 100 Kbar). Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. May be repeated for credit. **Chronister**

**CHEM 264. Novel Synthesis in Inorganic Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses strategies for the synthesis of novel structures in bioinorganic coordination, organometallic, and materials chemistry. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade based on seminar participation. Course is repeatable. **Reed**

**CHEM 265. Raman Spectroscopy of Biological Systems (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Applications of Raman spectroscopy to the characterization of the structure and function of biological membranes and membrane proteins. Emphasis will be placed on resonance enhanced Raman scattering, including the theoretical origins of resonance enhancement. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Bocian**

**CHEM 266. Molecular Recognition and Catalysis (2)** Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Explores topics in biological and organic chemistry relevant to the study of molecular recognition. Emphasizes the study of non-covalent forces in self-association and the properties of macromolecular constructs. Also involves the study of the synthetic organic and inorganic chemistry used to create these constructs. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Hooley**

**CHEM 267. Organic Electronic Materials (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. A study of design, synthesis, purification, manufacture, and application of carbon-based electronic materials. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with CEE 254. **Haddon**

**CHEM 269. New Trends in Main Group Chemistry (2)** Seminar, 2 hours. Prerequisite(s): senior or graduate standing in Chemistry or consent of instructor. Training in modern main group chemistry, covering boron, silicon, phosphorous, and related elements. Organic and inorganic chemists benefit from this course. Introduces students to the peculiar properties of these elements, thus enabling them to use this knowledge in their own field of expertise. Students who present a seminar or submit a term paper receive

a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 270. Theoretical Quantum Chemistry: Methods and Applications (2)** Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Explores topics in computational quantum chemistry relevant to both wave function and density functional theories. Emphasizes new computational algorithms and physical approximations that can be used to accelerate calculations and the applications of these methods to solve chemical problems. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Beran**

**CHEM 271. Design, Synthesis, and Applications of Highly Conjugated Organic Systems (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the design and synthesis of highly conjugated organic molecules and polymers for application in molecule-based devices such as sensors, light emitting diodes, and conductors. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Marsella**

**CHEM 272. Gaseous Ion Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Surveys all aspects of ion chemistry in the gas phase. Topics include mass spectrometry, ion mobility, electrospray ionization, matrix-assisted laser desorption ionization, ion-molecule reactions, ion-ion reactions, quantum calculations, instrumentation, and photodissociation spectroscopy. Emphasis is on bioanalytical applications for the study of protein structure, folding, and assembly. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Julian**

**CHEM 273. Bioanalytical Nuclear Magnetic Resonance Spectroscopy (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Development of Pulse Fourier transform NMR techniques and their application to the characterization of peptides, proteins and intact cells. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. May be repeated for credit. **Rabenstein**

**CHEM 274. Chemical Biology (2)** Seminar, 2 hours. Prerequisite(s): senior or graduate standing in Chemistry or consent of instructor. Involves formal presentations by graduate students on topics in the current literature and their research. Presentation responsibilities rotate among enrolled students and postdoctoral fellows. Also entails team work on problem sets and oral presentation of solutions. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Pirring**

**CHEM 275. Bioorganic Chemistry of Nucleic Acids (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. The design, synthesis, and evaluation of nucleotides with novel hydrogen-bonding capabilities as well as oligonucleotides capable of regulating gene expression. Discussion of ribonucleic acid catalysis, including possible catalytic functions that have not yet been determined. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Switzer**

**CHEM 277. Surface Chemistry (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussions for

new advances in surface science, concentrating mainly on the use of molecular level. Letter grades will be assigned to students who present a paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. **Zaera**

**CHEM 278. Nuclear Magnetic Resonance: Theory, Techniques, and Applications (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the development of solid-state and liquid-state nuclear magnetic resonance (NMR) as a probe of molecular structure, function, and dynamics with applications that range from chemistry to physics and biology. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade based on seminar participation. Course is repeatable. **Mueller**

**CHEM 279. Molecular Spectroscopy (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Properties of excited states of molecules. Molecular photophysics and photochemistry. Theory of radiationless transitions. Kinetics and mechanism of excited state decay. Laser spectroscopy. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. May be repeated for credit.

**CHEM 280. Chemistry and Biochemistry of Gaseous Molecules (2)** Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): consent of instructor. Reactions and properties of organic compounds and ions in the absence of bulk media. Preparative mass spectrometry and ion-molecule reactions. Molecular mechanisms in the sense of smell. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. May be repeated for credit. **Morton**

**CHEM 281. Interface between Heteroatom and Transition Metal Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Discusses heteroatom chemistry as a source of new ligands for transition metal chemistry and applications in catalysis and material science. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 282. Elementary Processes in Atmospheric Chemistry (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Applies state-of-the-art laser techniques to investigate elementary processes in atmospheric chemistry. Emphasis is quantitative understandings of atmospheric free-radical intermediates, their photochemistry, and their reaction mechanisms. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Zhang**

**CHEM 283. Development of Inorganic Solid State Materials (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on the development of advanced materials such as optical, electronic, and porous materials. Topics include synthetic methods, characterization techniques, property measurements, and device applications. Special emphasis is placed on the design of synthetic strategies for the discovery of new functional materials with novel properties. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade based on seminar participation. Course is repeatable. **Feng**

**CHEM 284. Biological Mass Spectrometry (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent

of instructor. A study of the synthesis, purification, and mass spectrometric characterization of biomolecules, nucleic acids in particular. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 285. Bio-inspired Materials and Chemical Sensors (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. A study of biomaterials and their application in analytical chemistry. Focus is on the design and synthesis of new materials, electrochemical detection, and the Surface Plasmon Resonance (SPR) technique. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 286. Time-Resolved Spectroscopy and Microscopy and Dynamics in Complex Systems (2) F, W, S** Seminar, 2 hours. Prerequisite(s): senior or graduate standing in Chemistry or consent of instructor. A comprehensive survey of modern time-resolved spectroscopy and microscopy techniques. Emphasizes applications to outstanding problems in materials science and biology. Specific problems include the measurement of energy transport in organic semiconductors and DNA dynamics in biological media. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Bardeen**

**CHEM 287. Modeling Molecular Recognition (2)** Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Focuses on molecular recognition and systems-level simulations, addressing theory and applications. Includes statistical mechanics (as applied to the prediction of equilibrium and nonequilibrium properties of chemical and biological systems), drug design and discovery, and cheminformatics. Utilizes numerical analysis, molecular dynamics and Brownian dynamics simulations, docking and scoring programs, and chemical database tools. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 288. Bioanalytical Applications of Nuclear Magnetic Resonance (NMR) and Mass Spectrometry (MS) (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Focuses on the study of ligand-protein interactions, metabonomics, with special emphasis on the application of hyphenated NMR and MS experiments. Also discusses new NMR pulse sequences and microcoil probes. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**CHEM 289. Special Topics in Neuroscience (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, BIOL 289, ENTM 289, NRSC 289, and PSYC 289. **Haddon in charge**

**CHEM 297. Directed Research (1-6)** Prerequisite(s): consent of a staff member. Research in analytical, inorganic, organic, or physical chemistry under the direction of a member of the staff. A written report is required of the research study. Graded Satisfactory (S) or No Credit (NC).

**CHEM 299. Research for Thesis or Dissertation (1-12)** Prerequisite(s): consent of a staff member. Research in analytical, inorganic, organic, or physical chemistry under the direction of a member of the staff. This research is to be included as part of the dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

### CHEM 301. Oral Presentations in Chemistry (1)

Lecture, 1 hour. The technique of oral presentation, emphasizing the problems that arise in chemistry laboratory and classroom situations. Designed primarily for new graduate students in the Chemistry Department. Graded Satisfactory (S) or No Credit (NC).

**CHEM 302. Teaching Practicum (1-2)** lecture/laboratory, 4-8 hours. Prerequisite(s): Limited to Chemistry Department teaching assistants and Associates-In Chemistry. Supervised teaching in undergraduate courses in Chemistry. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Units are not applicable to degree unit requirements.

## The Chicano Bilingual-Bicultural Studies Minor

### College of Humanities, Arts, and Social Sciences

Adalberto Aguirre, Jr., Ph.D., Chair  
Office, 1140 Watkins Hall  
(951) 827-5507; [chicanobstudies.ucr.edu](http://chicanobstudies.ucr.edu)

#### Committee in Charge

Philip Gericke, Ph.D. (Spanish and Portuguese)  
Alfredo M. Mirandé, Ph.D. (Ethnic Studies)  
Yolanda Venegas, Ed.D.  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

The Chicano Bilingual-Bicultural Studies minor provides the student with a basic understanding of the Spanish language and of the Mexican American bicultural contexts in which that language is used in the southwestern United States.

- Lower-division requirements (8 units)
  - Four (4) units from ETST 002, ETST 004/HIST 004
  - Four (4) units from one of the following:
    - SPN 006
    - Any upper-division course taught in Spanish language
- Upper-division requirements (16 units)
  - One course in the general area of Education and Bilingualism from ETST 146/EDUC 146, ETST 163/SOC 163, ETST 165/SOC 165, ETST 166
  - One course from the general area of Societal Perspectives on the Chicano Experience ETST 142

- c) One course from ETST 123, ETST 124, ETST 126, ETST 128/SOC 128
- d) One course in Chicano Art or Literature from ETST 108P, ETST 114, ETST 153/LNST 153, ETST 191N

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Comparative Literature and Foreign Languages

### College of Humanities, Arts, and Social Sciences

Thomas F. Scanlon, Ph.D., Chair  
Department Office, 2402 Humanities and Social Sciences  
(951) 827-1462; [complitforlang.ucr.edu](mailto:complitforlang.ucr.edu)

#### Professors

- Stephanie B. Hammer, Ph.D. *Germanic Studies/Comparative Literature*
- Eugene Perry Link, Ph.D., Chancellorial Chair for Innovative Teaching, *Chinese Literature, Language and Culture*
- Hendrik M.J. Maier, Ph.D. *Literature of Southeast Asia and Indonesia/Comparative Literature*
- Lisa A. Raphals, Ph.D. *Chinese/Comparative Literature*
- Thomas F. Scanlon, Ph.D. *Classics/Comparative Ancient Civilizations/Comparative Literature*
- Marguerite Waller, Ph.D. *Italian/Comparative Literature (Women's Studies/Comparative Literature and Foreign Languages)*
- Yenna Wu, Ph.D. *Chinese/Civilizations/Comparative Literature*

#### Professors Emeriti

- Sam J. Borg, Ph.D. *French*
- David K. Danow, Ph.D. *Russian/Comparative Literature*
- Donald G. Daviau, Ph.D. *Germanic Studies*
- Henry W. Decker, Ph.D. *French*
- Robert B. Griffin, Ph.D. *Comparative Literature/French*
- Georg M. Gugelberger, Ph.D. *Comparative Literature*
- Jules F. Levin, Ph.D. *Linguistics/Russian*
- Eliud Martínez, Ph.D. *Comparative Literature (Comparative Literature and Foreign Languages/Creative Writing)*
- Josef Purkart, Ph.D. *Germanic Studies*
- Lubomir Radoyce, M.A. *Russian/Comparative Literature*
- Theda Shapiro, Ph.D. *French/Comparative Literature*
- George E. Slusser, Ph.D., *Comparative Literature*
- Ben F. Stoltzfus, Ph.D., Litt.D. *Comparative Literature/French (Comparative Literature and Foreign Languages/Creative Writing)*

#### Associate Professors

- Michelle E. Bloom, Ph.D. *Comparative Literature/French*
- Mariam Beevi Lam, Ph.D. *Comparative Literature/Vietnamese*

Margherita Long, Ph.D. *Japanese/Comparative Literature*

Yang Ye, Ph.D. *Chinese/Comparative Literature*

#### Assistant Professors

- Heidi Brevik-Zender, Ph.D. *French/Comparative Literature*
- Sabine Doran, Ph.D. *German Literature/Comparative Literature*
- Kelly Jeong, Ph.D. *Korean Literature and Culture*
- John N. Kim, Ph.D. *German/Japanese/Comparative Literature*
- Jeffrey Sacks, Ph.D. *Arabic Literature/Comparative Literature*
- Annmaria Shimabuku, Ph.D. *Japanese Literature and Culture/Comparative Literature*

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#### Lecturers

- Han-hua Chao, Ph.D. *Chinese*
- Jingsong Chen, Ph.D. *Chinese*
- Christine Duvergé, Ph.D. *French*
- Yoshiko T. Hain, M.A. *Japanese*
- Young Hong, Ph.D. *Korean*
- Shuliang Hsu, M.A. *Chinese*
- Benjamin King, Ph.D. *Classics*
- Boohyun Lee, Ph.D. *Korean*
- Nicoletta Tinozzi Mehrmand, Ph.D. *Italian*
- Kim Dzung Pham, M.A. *Vietnamese*
- Jennifer Ramos, M.A. *French*
- Wendy J. Raschke, Ph.D. *Classics/Comparative Literature/Comparative Ancient Civilizations*
- Kyoko Sagawa, M.A. *Japanese*
- Reiko Sato, M.A. *Japanese*
- Cheryl Tarantino, M.A. *Italian/French*
- Sabine Thuerwaechter, Ph.D. *German/Comparative Literature*
- Kelle Truby, Ph.D. *French*
- Heidi Waltz, Ph.D. *Linguistics/Germanic Studies*
- Ekaterina Yudina, Ph.D. *Russian*

## Majors

The Department of Comparative Literature and Foreign Languages offers courses and degree programs in Western and non-Western national literatures, languages, and civilizations. It also has programs in Comparative Literature, Comparative Ancient Civilizations, and Linguistics. The department believes in the importance of offering fundamental training in the humanities in their own literary and linguistic contexts as well as in their cultural and interdisciplinary dimensions. Accordingly, students may obtain degrees or take courses in a specialized field, while at the same time enhancing the breadth of their education within and outside of the department.

The department offers the following majors leading to the B.A. degree.

### Asian Literatures and Cultures

The B.A. degree in Asian Literatures and Cultures offers a diverse, flexible program for students interested in the study of Asian languages, cultures, and literatures. Under this heading, students can choose either the Chinese or Japanese track.

### Classical Studies

The B.A. in Classical Studies combines the study of Greek and/or Latin language and literature with courses which explore the historical, philosophical, political, and cultural developments of Greece and Rome and their impact on Western civilization. The department is a

joint member of the UC Tri-Campus Graduate Program in Classics (UCI, UCR, UCSD), which offers M.A. and Ph.D. degrees in Classics.

## Comparative Ancient Civilizations

For the B.A. in Comparative Ancient Civilizations, students employ the methods of humanities and social sciences in the comparison study of several major cultures of the past. They acquire skills of historical and social analysis, multicultural awareness, and insight into constructions of civilizations in general.

## Comparative Literature

The department offers the B.A. degree in Languages and Literatures/Comparative Literature and the M.A. and Ph.D. graduate degrees in Comparative Literature.

While students majoring in Languages and Literatures/Comparative Literature must have a knowledge of the languages involved in the literatures of their choice, Comparative Literature courses themselves are open to all students. All work is done in translation and the courses are given in English.

## French, Germanic Studies, and Russian Studies

The B.A. degree is offered in Languages and Literatures/French, Languages and Literatures/Germanic Studies, and Russian Studies. Requirements for degrees include proficiency in the language of the literature.

## Languages

The Languages and Literatures/Languages major allows a student to specialize in two foreign languages through a knowledge not only of the languages themselves but also of the bases of language (linguistics), examples of their creative use (literature), and the cultures which they reflect (civilization).

## Linguistics

A B.A. in Linguistics is available through a program administered by an interdepartmental committee. Some foreign language study is essential for specialization in this discipline, as well as the pursuit of research projects and other kinds of practical work in linguistic-related areas.

## Graduate Degrees

Comparative Literature (interliterary) M.A.

Comparative Literature (interliterary or interdisciplinary) Ph.D.

UC Tri-Campus Graduate Program in Classics M.A. and Ph.D.

## Teaching Assistantships and Fellowships

Teaching assistantships and fellowships are available. Teaching assistants are normally held for CPLT 301 (Teaching of Foreign Language at the College Level). Course work and/or teach-

ing experience at another college-level institution may be accepted in fulfillment of this requirement.

## Education Abroad Program

The EAP is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units towards graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [international-center.ucr.edu](http://international-center.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

Requirements for the majors and courses offered are described in the following sections.

### Arabic Language

#### Arabic Literatures and Cultures

#### Asian Literatures and Cultures

Chinese  
Filipino  
Japanese  
Korean  
Southeast Asian Studies  
Vietnamese

### Civilization

#### Classical Studies

Classics  
Greek  
Latin

### Comparative Ancient Civilizations

#### Comparative and World Literature

Languages and Literatures/Comparative Literature

### Italian Studies

#### Languages and Literatures/French

#### Languages and Literatures/Germanic Studies

#### Languages and Literatures/Languages

### Linguistics

#### Literatures and Languages

### Russian Studies

## Minors

Minor programs offered in the Department of Comparative Literature and Foreign Languages are:

### Arabic

#### Asian Literatures and Cultures

Chinese Track  
Japanese Track  
Korean Track  
Southeast Asian Track

### Classical Studies

### French

### Germanic Studies

### Italian Studies

### Russian Studies

### Spanish

# Arabic Minor

This minor introduces the field of Arabic studies, and offers training in the Arabic language and in the close reading of texts— including poetry, literature, philosophy, theoretical writings, essays, and film—with attention to problems of translation, the history of disciplines, and the formation of institutions. It teaches students to read cultural objects, practices, texts, and institutions as active sites of translation, negotiation, contestation, and invention.

### Minor Requirements

- Lower Division Requirements (language proficiency)
  - ARBC 001, 002, 003, and 004
- Upper Division Requirements (16 units)
  - Twelve upper-division units in Arabic Literature and Culture from ARLC 120, ARLC 151/CPLT 151/MEIS 151, ARLC 152/CPLT 152, ARLC 156/CPLT 156/MEIS 156/RLST 156, ARLC 154/CPLT 154/PHIL 128, ARLC 158/CPLT 158/MEIS 158/RLST 158, ARLC 155/CPLT 155/MEIS 155/RLST 157
  - Four upper-division units from CPLT 110 or a related upper-division course

# Arabic Language

**Foreign Language Placement Examination A** placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and [placementtest.ucr.edu](http://placementtest.ucr.edu) for date and time. Transfer students who have taken a college-level language course cannot take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**ARBC 001. Elementary Arabic (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Arabic place-

ment examination. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

**ARBC 002. Elementary Arabic (4)** Lecture, 4 hours. Prerequisite(s): ARBC 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

**ARBC 003. Elementary Arabic (4)** Lecture, 4 hours. Prerequisite(s): ARBC 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

**ARBC 004. Intermediate Arabic (4)** Lecture, 4 hours. Prerequisite(s): ARBC 003 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

**ARBC 005. Intermediate Arabic (4)** Lecture, 4 hours. Prerequisite(s): ARBC 004 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

**ARBC 006. Intermediate Arabic (4)** Lecture, 4 hours. Prerequisite(s): ARBC 005 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

## Upper-Division Courses

**ARBC 101A. Advanced Arabic (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 006 or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Class conducted in Arabic.

**ARBC 101B. Advanced Arabic (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 101A or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Class conducted in Arabic.

**ARBC 101C. Advanced Arabic (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 101B or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy

in listening, speaking, reading, and writing. Class conducted in Arabic.

## Arabic Literatures and Cultures

### Upper-Division Courses

**ARLC 120. Classical Arabic Literary Prose (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores aspects of classical Arabic literary prose. Includes the modes of quotation, citation, falsification, fabrication, and forgery. Focuses upon selected writings of al-Hamadhai, al-Jahiz, al-Ma'arri, Ibn Tufayl, and Ibn Hazim.

**ARLC 151. Palestine/Algeria (4)** Lecture, 3 hours; screening, 6 hours per quarter; extra reading, 24 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Considers two distinct and related literary and historical moments: Palestine and Algeria. Topics include the relations between language and context; literature and literary historiography; genre and idiom; violence and the body; and the state and institutional practices of reading. Cross-listed with CPLT 151 and MEIS 151.

**ARLC 152. Modern Arabic Poetry in a Multilingual Frame (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers selected writings of Adunis ('Ali Ahmed Sa'id), Mahmoud Darwish, Abdelatif La'abi, and Etel Adnan, published originally in Arabic, French, and English. Topics include language (idiom, statement, utterance, translation, repetition, rhythm) and history (loss, violence, mourning, inheritance, future, legacy). Course is taught in English. Cross-listed with CPLT 152.

**ARLC 154. Introduction to Arabic Philosophy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic philosophical texts. Provides close and literary reading of texts in philosophy, as well as considers the impact these texts have had or can have on Western cultural formation. Cross-listed with CPLT 154 and PHIL 128.

**ARLC 155. Introduction to Arabic Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic literature that focuses on language and rhetoric. Considers major issues such as colonialism, secularism, modernity, language, and the state. Utilizes texts from literature, the law, and philosophy. Cross-listed with CPLT 155, MEIS 155, and RLST 157.

**ARLC 156. Jews and Arabs (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with CPLT 156, MEIS 156, and RLST 156.

**ARLC 158. Islam and Psychoanalysis (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores contemporary psychoanalytic readings of Islam to consider the relationship between Islam and Orientalism, Orientalism and psychoanalysis, and psychoanalysis and Islam. Cross-listed with CPLT 158, MEIS 158, and RLST 158.

## Asian Literatures and Cultures

**Subject abbreviations: CHN, JPN, KOR, SEAS, TAG, VNM**

### Committee in Charge

Yenna Wu, Ph.D., Chair, *Chinese/Civilizations/Comparative Literature*  
 Kelly Jeong, Ph.D. *Korean Literature and Culture*  
 John N. Kim, Ph.D., *German/Japanese/Comparative Literature*  
 Mariam Beevi Lam, Ph.D. *Vietnamese/Comparative Literature*  
 Margherita Long, Ph.D. *Japanese/Comparative Literature*  
 Perry Link, Ph.D. *Chinese Literature, Language and Culture*  
 Hendrik M.J. Maier, Ph.D. *Southeast Asian Literature/Comparative Literature*  
 Lisa Raphals, Ph.D. *Chinese/Comparative Literature*  
 Annmaria Shimabuku, Ph.D. *Japanese Literature and Culture*  
 Yang Ye, Ph.D. *Chinese/Civilizations/Comparative Literature*  
 Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

### Major

The Asian Literatures and Cultures Major offers a diverse and flexible program for students interested in the study of Asian languages, cultures, and literatures. While language proficiency and some courses in literature or culture are required, students have considerable freedom within the major to make course selections based on their own areas of interest. Students may either study a national literature in depth in the original language or focus more broadly on culture, history, and literature using texts in English translation. They may also choose between concentrating on one national literature and cultural tradition or including other Asian literatures and cultures. The major is flexibly interdisciplinary, giving students the opportunity to combine courses from different UCR departments (e.g., Art History, History, Religious Studies) as appropriate for their field of study.

### Chinese Track (44 units)

1. Lower-division requirements (8 units plus language proficiency)
  - a) Proficiency in Chinese through the intermediate level (CHN 006 or its equivalent)
  - b) Eight (8) units from lower-division lecture courses on Chinese literature and culture: AST 030/CHN 030, AST 040/CHN 040, AST 046/CHN 046, AST 048/CHN 048. Four (4) units can be from other courses on Asian literature and culture from the department as well as China-related courses from other departments (with adviser's consent).
2. Upper-division requirements (36 units)
  - a) Sixteen (16) units in Chinese language

from CHN 101A, CHN 101B, CHN 101C, CHN 102, CHN 105, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z)

- b) Twelve (12) units in Chinese literature and culture from CHN 104, CHN 105, CHN 106/PHIL 123, AST 107/CHN 107/RLST 107, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z), CHN 134, AST 135/CHN 135, AST 136/CHN 136, AST 142/CHN 142, CPLT 142E/WMST 142E, AST 148/CHN 148, AST 185/CHN 185/MCS 169, CHN 190
- c) Eight (8) units in Asian literatures and cultures: can be chosen from all the upper-division lecture courses on Asian literature and culture from the department as well as China-related upper-division courses from other departments (with adviser's consent), including the courses listed under (b).

### Japanese Track (44 units)

1. Lower-division requirements (8 units plus language proficiency)
  - a) Proficiency in Japanese through the intermediate level (JPN 006 or its equivalent)
  - b) Eight (8) units from lower-division lecture courses on Japanese literature and culture: AST 022/JPN 022, AST 032/JPN 032, AST 034/JPN 034, JPN 035. Four (4) units can be from other lower-division lecture courses on Asian literature and culture from the department as well as Japan-related lower-division courses from other departments (with adviser's consent).
2. Upper-division requirements (36 units)
  - a) Twelve (12) upper-division units in Japanese language from JPN 101A, JPN 101B, JPN 101C, JPN 110
  - b) Twelve (12) units in upper-division Japanese literature and culture from JPN 110, CPLT 142J/WMST 142J, JPN 150/AST 150, AST 151/JPN 151, AST 152 (E-Z)/JPN 152 (E-Z), AST 153 (E-Z)/JPN 153 (E-Z), AST 154 (E-Z)/JPN 154 (E-Z), AST 184/MCS 184/JPN 184, AST 190, JPN 190
  - c) Twelve (12) units in Asian literatures and cultures: can be chosen from all the upper-division lecture courses on Asian literature and culture from the department as well as Japan-related upper-division courses from other departments (with adviser's consent), including the courses listed under (b).

### Minor

The Asian Literatures and Cultures minor provides students with the opportunity to enhance their knowledge of Asian languages, cultures, and literatures.

### Chinese Track (24 units)

1. Lower-division requirements (4 units plus language proficiency)

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- a) Proficiency in Chinese through the intermediate level (second year)
  - b) Four (4) units from lower-division lecture courses on Chinese literature and culture: AST 030/CHN 030, AST 040/CHN 040, AST 046/CHN 046, AST 048/CHN 048
2. Upper-division requirements (20 units)
- a) 8 upper-division units in Chinese language from CHN 101A, CHN 101B, CHN 101C, CHN 102, CHN 105, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z)
  - b) Eight (8) units in Chinese literature and culture from CHN 104, CHN 105, CHN 106/PHIL 123, AST 107/CHN 107/RLST 107, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z), CHN 134, AST 135/CHN 135, AST 136/CHN 136, AST 142/CHN 142, CPLT 142E/WMST 142E, AST 148/CHN 148, AST 185/CHN 185/MCS 169, CHN 190
  - c) Four (4) units in Asian literatures and cultures: can be chosen from all the upper-division lecture courses on Asian literature and culture from the department as well as China-related upper-division courses from other departments (with adviser's consent), including the courses listed under (b).

### Japanese Track (24 units)

1. Lower-division requirements (4 units plus language proficiency)
  - a) Proficiency in Japanese through the intermediate level (JPN 006 or its equivalent)
  - b) Four (4) units from lower-division lecture courses on Japanese literature and culture: AST 022/JPN 022, AST 032/JPN 032, AST 034/JPN 034, JPN 035
2. Upper-division requirements (20 units)
  - a) Eight (8) upper-division units in Japanese language from: JPN 101A, JPN 101B, JPN 101C, JPN 110
  - b) Eight (8) units in Japanese literature and culture from: JPN 110, CPLT 142J/WMST 142J, JPN 150/AST 150, AST 151/JPN 151, AST 152 (E-Z)/JPN 152 (E-Z), AST 153 (E-Z)/JPN 153 (E-Z), AST 154 (E-Z)/JPN 154 (E-Z), AST 184/MCS 184/JPN 184, AST 190, JPN 190.
  - c) Four (4) units in Asian literatures and cultures: can be chosen from all the upper-division lecture courses on Asian literature and culture from the department as well as Japan-related upper-division courses from other departments (with adviser's consent), including the courses listed under (b).

### Korean Track (24 units)

1. Lower-division requirements (8 units plus language proficiency)
  - a) Proficiency in Korean through the intermediate level, KOR 005 (second year)

- b) Eight (8) units from lower-division lecture courses on Korean literature and culture: KOR 042, KOR 047/AST 047/MCS 047

### 2. Upper-division requirements (16 units)

- a) Four (4) upper-division units in Korean language from KOR 101
- b) Eight (8) units in Korean literature and culture from KOR 110 (E-Z), KOR 112/AST 112, Four (4) units in Asian literatures and cultures: can be chosen from all the upper-division lecture courses on Asian literature and culture from the department as well as Korea-related upper-division courses from other departments (with adviser's consent), including the courses listed under (2)

### Southeast Asian Track (24 units)

1. Lower-division requirements (8 units plus language proficiency)
  - a) Proficiency in one of the Southeast Asian languages (Vietnamese/Indonesian/Tagalog) through the first-year level
  - b) Eight (8) units from lower-division lecture courses on Southeast Asian literature and culture: AST 062/CPLT 062, AST 063/CPLT 063, AST 064/MCS 049/VNM 064, AST 065
2. Upper-division requirements (16 units)

Sixteen (16) units in Southeast Asian literature and culture from CPLT 142V/WMST 142V, AST 161, AST 162/HIST 187/VNM 162, AST 163/CPLT 163, AST 165 (E-Z)/VNM 165 (E-Z)/WMST 165(E-Z), AST 166/CPLT 166/VNM 166, AST 167/CPLT 167, AST 168/MUS 168, or graduate courses in Southeast Asian literature and culture (with consent of instructor) such as CPLT 200/SEAS 200 and CPLT 205/SEAS 205

## Chinese Courses

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and **placement-test.ucr.edu** for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**CHN 001. First-Year Chinese (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Chinese placement examination. An introduction to the sound system and grammar of Chinese. Focuses on the development of the four skills: understanding, speaking,

reading, and writing. Classes are conducted in Chinese as much as possible. Audio-lingual learning materials are available in the language laboratory. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

**CHN 002. First-Year Chinese (4)** Lecture, 4 hours. Prerequisite(s): CHN 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. An introduction to the sound system and grammar of Chinese. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes are conducted in Chinese as much as possible. Audio-lingual learning materials are available in the language laboratory. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

**CHN 003. First-Year Chinese (4)** Lecture, 4 hours. Prerequisite(s): CHN 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. An introduction to the sound system and grammar of Chinese. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes are conducted in Chinese as much as possible. Audio-lingual learning materials are available in the language laboratory. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

**CHN 004. Second-Year Chinese (4)** Lecture, 4 hours. Prerequisite(s): CHN 003 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. Provides continuing development of the four skills: understanding, speaking, reading, and writing. Lectures are conducted primarily in Mandarin. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

**CHN 005. Second-Year Chinese (4)** Lecture, 4 hours. Prerequisite(s): CHN 004 or CHN 020B or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. Continued development of the four skills: understanding, speaking, reading, and writing. Lectures are conducted primarily in Mandarin. Credit is awarded for only one of CHN 025 or the CHN 005 and CHN 006 sequence.

**CHN 006. Second-Year Chinese (4)** Lecture, 4 hours. Prerequisite(s): CHN 005 or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. Continued development of the four skills: understanding, speaking, reading, and writing. Lectures are conducted primarily in Mandarin. Credit is awarded for only one of CHN 025 or the CHN 005 and CHN 006 sequence.

**CHN 020A. First-Year Chinese for Heritage Learners (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Chinese placement examination. A first-year Mandarin Chinese course designed for heritage learners who have some proficiency in listening comprehension and speaking but are unable to read and write in Mandarin. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN

003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

**CHN 020B. First-Year Chinese for Heritage Learners (4)**

Lecture, 4 hours. Prerequisite(s): CHN 002 with a grade of "C-" or better or CHN 020A with a grade of "C-" or better or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. A first-year Mandarin Chinese course designed for heritage learners who have some proficiency in listening comprehension and speaking but are unable to read and write in Mandarin. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

**CHN 025. Accelerated Second-Year Chinese (4)**

Lecture, 4 hours. Prerequisite(s): CHN 004 or CHN 020B or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. Designed for students with advanced comprehension and speaking skills. Focuses on improving reading and writing skills. Credit is awarded for only one of CHN 025 or the CHN 005 and CHN 006 sequence.

**CHN 030. Introduction to Chinese Civilization (5)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introduction to Chinese civilization through an interplay of philosophical, historical, religious, and literary readings from the ancient times through the modern age. Uses audiovisual media. All work is in English. Cross-listed with AST 030. **Ye**

**CHN 040. Masterworks of Chinese Literature (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. Reading and discussion of selected great works of Chinese literature (in English translation) with attention to cultural contexts. Various critical methods and approaches are used. Cross-listed with AST 040. **Wu, Ye**

**CHN 046. Responses to Political Repression in Modern Chinese Literature and Film (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An examination of the various responses to political repression in China during the second half of the twentieth century through selected literary and artistic representations. Cross-listed with AST 046.

**CHN 048. Chinese Cinema (4)**

Lecture, 2 hours; discussion, 1 hour; screening, 2 hours; outside research, 1 hour. Prerequisite(s): none. Study of selected films from China and Taiwan with attention to cultural context. Questions addressed may include the following: What do we look for in a film? What are the film's interrelations with theatre, photography, and literature? How do we understand the film as an art form? Cross-listed with AST 048. **Ye**

**CHN 090. Special Studies (1-5)**

Individual study, 3-15 hours. To be taken with the consent of the Chair of the Department as means of meeting special curricular problems in either language or literature. Course is repeatable.

## Upper-Division Courses

**CHN 101A. Third-Year Chinese (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CHN 006 or CHN 025 or equivalent. Further development of the four skills: understanding, speaking, reading, and writing; with an emphasis on reading and writing. Classes conducted in Mandarin.

**CHN 101B. Third-Year Chinese (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CHN 101A or equivalent or consent of instructor. Further devel-

opment of the four skills: understanding, speaking, reading, and writing; with an emphasis on reading and writing. Classes conducted in Mandarin.

**CHN 101C. Third-Year Chinese (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CHN 101B or equivalent or consent of instructor. Further development of the four skills: understanding, speaking, reading, and writing; with an emphasis on reading and writing. Classes conducted in Mandarin.

**CHN 102. Fourth-Year Chinese (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CHN 101C or equivalent. Reinforces speaking, reading, and writing skills through study of a broad range of texts and various styles of writing. Course is repeatable as content changes to a maximum of 8 units.

**CHN 104. Introduction to Classical Chinese Texts (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): CHN 003 or equivalent or consent of instructor. Introduction to classical Chinese philosophical and historical texts. Readings of primary source materials and analysis of grammar and usage. Class is conducted in English.

**CHN 105. Classical Chinese Prose (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): CHN 101C. Close reading of selected texts from the Han and pre-Han period, chosen to illustrate the main features of the Chinese *Ku-wen* (classical prose). **Ye**

**CHN 106. Readings in Classical Chinese**

**Philosophy (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CHN 104 or consent of instructor. Introduces selections from key philosophical texts in classical Chinese. Focuses on a combination of Chinese reading and philosophical understanding. Cross-listed with PHIL 123.

**CHN 107. Taoist Traditions (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AST 030/CHN 030 or upper-division standing or consent of instructor. A survey of the ancient mystical and philosophical aspects of Taoism as well as the living religious tradition, their relationships to each other, and their expression in Chinese culture and civilization. Topics include the Tao Te Ching, the *Chuang-tzu*, the Taoist canon, meditation, immortality, alchemy, and ritual. Cross-listed with AST 107 and RLST 107. **Raphals**

**CHN 108. Introduction to Classical Chinese Poetry (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 102 or equivalent. Explores the representative texts in various genres and forms that illustrate the development of classical Chinese poetry from its origin through the premodern age. Course conducted primarily in Chinese. **Ye**

**CHN 110 (E-Z). Readings in Twentieth-Century Chinese Literature (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 102 or equivalent. Presents the works of major authors of twentieth-century Chinese literature. Course conducted in Chinese. E. Contemporary Chinese Fiction; M. Modern Chinese Fiction; S. Modern Chinese Poetry; T. Love in Taiwanese and Chinese Stories; W. Modern Chinese Prose. Credit is awarded for only one of CHN 110E or CHN 137 and for only one of CHN 110M or CHN 134. **Wu, Ye**

**CHN 115 (E-Z). Readings in Thirteenth- to Nineteenth-Century Chinese Literature (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 102 or equivalent. Covers vernacular literature from the Yuan to the Qing dynasties. Course conducted in Chinese. G. Honglou meng; M. Ming Novel; Q. Qing Novel; S. The Short Story; Y. Yuan Drama. **Wu**

**CHN 131. Readings in the Origins of Science in China and Greece (4)**

Lecture, 3 hours; extra reading, 3

hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the ancient scientific traditions of China and Greece and compares to modern scientific categories. Includes ideas about nature, the body, and systematic accounts of the natural world. Cross-listed with AST 131, CLA 131, and CPAC 131.

**CHN 132. Medical Traditions in China and Greece (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative examination of the early development of Western medical traditions in classical Greece and the origins and development of the Chinese medical systems now referred to as traditional Chinese medicine, with specific attention to their cultural and social contexts. Cross-listed with AST 132, CLA 132, and CPAC 132.

**CHN 134. Modern Chinese Literature in Translation (4)**

Seminar, 2 hours; lecture, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to major works of Chinese fiction, drama, and poetry from the first half of the twentieth century. Considers literary quality and technique, as well as the social and political ideas of Chinese writers during a turbulent time in China's history. Credit is awarded for only one of CHN 110M or CHN 134.

**CHN 135. Great Novels of China (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the social, philosophical, and aesthetic features in major Ming-Qing novels through critical reading and analysis of literature in translation. No knowledge of Chinese required. Cross-listed with AST 135. **Wu**

**CHN 136. Family and Gender in the Chinese Short Story (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines a broad array of short stories from the Tang to the Qing dynasties (approximately ninth to eighteenth century). Investigates love, marriage, family, gender dynamics, and the representation of women in Chinese literature. No knowledge of Chinese required. Cross-listed with AST 136. **Wu**

**CHN 137. Contemporary Chinese Literature in Translation (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to important works of fiction, drama, poetry, and reportage from the mid-twentieth century to the present. Includes readings from mainland China, as well as writings from Taiwan and other overseas communities. Credit is awarded for only one of CHN 110E or CHN 137.

**CHN 141. Militarism and Hegemony in the Ancient World (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with AST 145, CLA 141, CPAC 141, and POSC 140.

**CHN 142. Chuang-tzu (4)**

Lecture, 1 hour; discussion, 2 hours; outside research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): RLST 005 or RLST 005H or AST 107/CHN 107/RLST 107 or consent of instructor. An examination of chaos, epistemological and linguistic relativism, fate, skill, and the character of the sage in perhaps the most significant of Chinese Taoist texts, the *Chuang-tzu*. Discussion of the structure and style of this literary masterpiece. Students with knowledge of classical Chinese may

arrange additional work through special studies. Cross-listed with AST 142 and RLST 142. **Nyitray**

**CHN 148. Chinese Poetry and Poetics in Translation (4)** Lecture, 2 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examination of traditional Chinese poetry through the study of selected major texts, emphasizing forms, themes, and Chinese poetics in its close relation to the development of Chinese literature. Classes are conducted in English. Cross-listed with AST 148. **Ye**

**CHN 185. New Chinese Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of representative films from the People's Republic of China, with a focus on those made during the last decade. Conducted in English; most films have English subtitles. Cross-listed with AST 185 and MCS 169. **Ye**

**CHN 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing or consent of instructor. To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems in either language or literature. Course is repeatable.

**CHN 195. Senior Thesis (2-4)** Thesis, 6-12 hours. Prerequisite(s): senior standing; consent of instructor. Individual research and preparation of a thesis completed under the supervision of a faculty member. Course is repeatable to a maximum of 12 units.

## Filipino Courses

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and **placement-test.ucr.edu** for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**FIL 001. First-Year Filipino (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Filipino placement examination. An introduction to the sound system and grammar of Filipino. Emphasizes reading, writing, understanding, and speaking. Conducted in Filipino whenever possible.

**FIL 002. First-Year Filipino (4)** Lecture, 4 hours. Prerequisite(s): FIL 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Filipino placement examination as determined by the department faculty. An introduction to the sound system and grammar of Filipino. Emphasizes reading, writing, understanding, and speaking. Conducted in Filipino whenever possible.

**FIL 003. First-Year Filipino (4)** Lecture, 4 hours. Prerequisite(s): FIL 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Filipino placement examination as determined by the department faculty. An introduction to the sound system and grammar of Filipino. Emphasizes reading,

writing, understanding, and speaking. Conducted in Filipino whenever possible.

**FIL 004. Second-Year Filipino (4)** Lecture, 4 hours. Prerequisite(s): FIL 003 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Filipino placement examination as determined by department faculty. Emphasizes further development of the four language skills: reading, writing, understanding, and speaking. Conducted primarily in Filipino.

## Japanese Courses

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and **placement-test.ucr.edu** for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**JPN 001. First-Year Japanese (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Japanese placement examination. An introduction to the sound system and grammar of Japanese. Emphasizes speaking, reading, writing, and comprehension skills. Classes are conducted in Japanese whenever possible. Credit is awarded for only one of the following sequences: JPN 001, JPN 002, and JPN 003; JPN 010A and JPN 010B.

**JPN 002. First-Year Japanese (4)** Lecture, 4 hours. Prerequisite(s): JPN 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Japanese with emphasis on speaking, reading, writing, and understanding. Classes are conducted in Japanese insofar as possible. Credit is awarded for only one of the JPN 001, JPN 002, and JPN 003 or JPN 010A and JPN 010B sequences.

**JPN 003. First-Year Japanese (4)** Lecture, 4 hours. Prerequisite(s): JPN 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Japanese with emphasis on speaking, reading, writing, and understanding. Classes are conducted in Japanese insofar as possible. Credit is awarded for only one of the JPN 001, JPN 002, and JPN 003 or JPN 010A and JPN 010B sequences.

**JPN 004. Second-Year Japanese (4)** Lecture, 4 hours. Prerequisite(s): JPN 003 with a grade of "C-" or better or JPN 010B with a grade of "C-" or better or equivalent. Introduces levels of speech and emphasizes reading and writing of advanced prose.

**JPN 005. Second-Year Japanese (4)** Lecture, 4 hours. Prerequisite(s): JPN 004 or equivalent. Concentrates on advanced speech levels and their cultural underpinnings.

**JPN 006. Second-Year Japanese (4)** Lecture, 4 hours. Prerequisite(s): JPN 005 or equivalent. Emphasizes the academic style of written and spoken Japanese and academic comprehension of the cultural background.

**JPN 009. Supplementary Work in Kanji (1)** Lecture, 1 hour. Prerequisite(s): JPN 001 or equivalent, concurrent enrollment in JPN 002 or JPN 003 or JPN 004; or consent of instructor. Introduction to Kanji skills beyond that covered in JPN 001. Provides background information on the use, systematics, and function of Kanji characters. Supplements Japanese language classes and provides additional instruction for heritage learners. Course is repeatable as student's language level changes.

**JPN 010A. Intensive First-Year Japanese (6)** Lecture, 4 hours; discussion, 2 hours. Prerequisite(s): Student must take the Japanese placement examination. An intensive introduction to Japanese. Addresses speaking, reading, writing, and comprehension skills. The JPN 010A and JPN 010B sequence covers the same material as the JPN 001, 002, and 003 sequence. Credit is awarded for only one of the following sequences: JPN 001, JPN 002, and JPN 003; JPN 010A and JPN 010B.

**JPN 010B. Intensive First-Year Japanese (6)** Lecture, 4 hours; discussion, 2 hours. Prerequisite(s): JPN 010A with a grade of "C-" or better or equivalent. Conclusion of intensive first-year Japanese, with emphasis among speaking, reading, writing, and understanding. The intensive JPN 010A and JPN 010B sequence covers the same material as the JPN 001, JPN 002, and JPN 003 sequence. Credit is awarded for only one of the JPN 001, JPN 002, and JPN 003 or JPN 010A and JPN 010B sequences.

**JPN 022. Introduction to Japanese Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to Japan's major directors and to watching and writing about Japanese film. Works studied range from the samurai epics of Kurosawa to recent anime. All films have subtitles. No previous knowledge of Japanese language or culture is required. Cross-listed with AST 022 and MCS 022.

**JPN 023. Modern Japan and Personal Narrative (4)** Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Introduces major debates in history, politics, and culture through the genres of biography, autobiography, diary, and confession. Explores the parallel construction of the modern nation, the modern language, and the modern self. Traces the development of Japan's "I-novel." Builds skills in close reading by studying the rhetoric of self-narrative. Cross-listed with AST 023 and CPLT 023.

**JPN 032. Introduction to Japanese Folklore (4)** Lecture, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): none. Focuses on narrative genres of myth, legend, and folktale, with additional attention paid to festivals, folk craft, belief systems, and the development of folklore studies (*minzokugaku*) as an academic discipline. Examines the relationship of folklore to ethnic and national identity. Cross-listed with AST 032.

**JPN 034. Early Japanese Civilization (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. An introduction to Japanese civilization from earliest times to the dawn of the twentieth century. Devotes particular attention to aesthetic activity and to the relationship between history, culture, and the arts. Cross-listed with AST 034.

**JPN 035. Modern Japanese Society (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to Japanese culture and society with emphasis on the day-to-day lives of the modern Japanese people at home, work, and play.

**JPN 056. Cultures of the Japanese Empire (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none.

Covers the social histories and literatures of the Japanese Empire from the foundation of the Meiji state to the present. Includes the Ainu, Okinawan, Taiwanese, and Korean cultures. Explores the concepts of assimilation, citizenship, national language, nation-state, sovereignty, total war, and translation. Utilizes readings in English. Cross-listed with AST 056 and CPLT 056.

**JPN 090. Special Studies (1-5)** Individual study, 3-15 hours. To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems in either language or literature. Course is repeatable.

## Upper-Division Courses

**JPN 101A. Third-Year Japanese (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): JPN 006. Designed to develop students' reading, writing, and speaking abilities in Japanese. The course is conducted in Japanese.

**JPN 101B. Third-Year Japanese (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): JPN 101A. Designed to develop students' reading, writing, and speaking abilities in Japanese. The course is conducted in Japanese.

**JPN 101C. Third-Year Japanese (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): JPN 101B. Designed to develop students' reading, writing, and speaking abilities in Japanese. The course is conducted in Japanese.

**JPN 110. Advanced Reading in Japanese (4)** Lecture, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): previous or concurrent enrollment in JPN 101C or equivalent. Reading of extended authentic texts in Japanese. Texts may include newspaper or magazine articles, literature, or nonfiction. Emphasis may extend to translation, textual analysis, basic research using primary sources, or discussion of texts in Japanese. Course is repeatable as content changes.

**JPN 134. Cinematic War Memory (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines cinematic confrontations involving World War II in Germany and Japan. Topics include desire between victims and perpetrators, representation of trauma, and ethical responsibility. All screenings have English subtitles. Cross-listed with CPLT 134, GER 134, and MCS 114.

**JPN 145. Modern Japanese Thought (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of modern Japanese thought from a theoretical and intellectual historical perspective. Topics include philosophical discussions of modernization, "Westernization," nationalism, colonialism and imperialism, "comfort women," Japanese war crimes in continental Asia, the American bombing of Hiroshima and Nagasaki, post-World War II remembrance and denial. All readings are in English. Cross-listed with CPLT 145.

**JPN 150. In Women's Hands: Reading Japanese Women Writers (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines major works of Japanese women writers from Heian (ninth century) to contemporary, focusing on themes, genres, representations of gender, ideas of love and romance, and feminine aesthetics. Readings include fiction, poetry, essays, and drama, with the main emphasis on fictional writing. Classes are conducted in English. Cross-listed with AST 150.

**JPN 151. Early Japanese Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An in-depth introduction to early Japanese literature. Focuses on fiction, from early poem tales and court romances to warrior tales and stories of the floating world. Careful attention is given to the works' historical and cultural backgrounds and visual and artistic dimensions. All works are read in English translation. Course is repeatable as content changes. Cross-listed with AST 151.

**JPN 152 (E-Z). Themes in Modern Japanese Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to modern Japanese literature in translation, as seen through the lens of a particular theme or issue. All materials read or viewed in English. E. The End of the World in Japanese Literature; F. The Mask in Japanese Fiction; G. Love and Death; J. Classics and Canon; K. Dreams and Other Virtual Worlds. Cross-listed with AST 152 (E-Z).

**JPN 153 (E-Z). Themes in Early Japanese Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to early Japanese literature, as seen through the lens of a particular theme or issue. All works are read in English translation. E. Supernatural Japan; F. Warrior Japan; G. The Culture of the Floating World: Tokugawa Period Literature, Drama, and Art. Cross-listed with AST 153 (E-Z).

**JPN 154 (E-Z). Themes in the Folklore and Popular Culture of Japan (4)** Lecture, 2 hours; discussion, 1 hour; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include myth, legend, folktale, folk performance, festival, ritual, and the development of popular or commercial culture. Considers literary versus oral tradition, ethnic identity, authenticity, nationalism, modernity, commodification, and the invention of tradition. E. Ancient Myth to Contemporary Legend: A Study of Japanese Folk Narrative; F. History of Japanese Popular Culture. Cross-listed with AST 154 (E-Z).

**JPN 184. Japanese Media and Cultural Studies (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates Japanese media and culture including film, television, video games, *manga* (comics), *anime*, music, and print and digital media. Analyzes the function of media relating to issues of national identity, imperial culture, collective memory, and censorship. Includes transnational circulation of Japanese cultural forms, alternative media, and historical changes in technologies. Cross-listed with AST 184 and MCS 184.

**JPN 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing or consent of instructor. To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems in either language or literature. Course is repeatable.

## Korean Courses

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Schedule of Classes and [placementtest.ucr.edu](http://placementtest.ucr.edu) for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**KOR 001. First-Year Korean (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Korean placement examination. An introduction to the sound system and grammar of Korean. Emphasizes reading, writing, understanding, and speaking. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

**KOR 002. First-Year Korean (4)** Lecture, 4 hours. Prerequisite(s): KOR 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Korean with emphasis on reading, writing, understanding, and speaking. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

**KOR 003. First-Year Korean (4)** Lecture, 4 hours. Prerequisite(s): KOR 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Korean with emphasis on reading, writing, understanding, and speaking. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

**KOR 004. Second-Year Korean (4)** Lecture, 4 hours. Prerequisite(s): KOR 003 with a grade of "C-" or better or equivalent. A continuation of Korean language study. Emphasizes reading, writing, grammar, and conversation. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

**KOR 005. Second-Year Korean (4)** Lecture, 4 hours. Prerequisite(s): KOR 004 or KOR 020B or KOR 025. A continuation of Korean language study. Emphasizes reading, writing, grammar, and conversation. Conducted primarily in Korean.

**KOR 020A. First-Year Korean for Heritage Learners (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Korean placement examination. A first-year Korean course designed for heritage learners who have some proficiency in listening comprehension and speaking but are unable to read and write in Korean. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

**KOR 020B. First-Year Korean for Heritage Learners (4)** Lecture, 4 hours. Prerequisite(s): KOR 002 with a grade of "C-" or better or KOR 020A with a grade of "C-" or better or equivalent or a sufficiently high test score on the Korean placement examination as determined by the department faculty. A first-year Korean course designed for heritage learners who have some proficiency in listening comprehension and speaking but are unable to read and write in Korean. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

**KOR 025. Conversation and Composition (4)** Lecture, 4 hours. Prerequisite(s): KOR 003 or equivalent. Practice at the intermediate level in speaking and writing Korean. Regular discussion and oral presentation of assigned written topics. Provides a review of basic grammar with the goal of achieving oral and written command.

**KOR 042. Korean Culture and Society (4)** Lecture, 3 hours; screening, 15 hours per quarter; extra reading, 1.5 hours. Prerequisite(s): none. An introduction to major themes, events, and trends in Korean culture and society. Covers the end of the nineteenth century to the present. All readings are in English, and all films have subtitles.

**KOR 047. Introduction to Korean Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the major directors and films of Korea. Covers the genres and periods of works produced from the 1960s to the present. All films have English subtitles. No previous knowledge of Korean language or culture required. Cross-listed with AST 047 and MCS 047.

## Upper-Division Course

**KOR 101. Advanced Korean (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): KOR 005 or consent of instructor. Designed to develop students' fluency in Korean to the level of intellectual conversation. Students review Korean web sites, view Korean films, read Korean short stories and journal articles, and discuss current issues of Korean society. Course is repeatable as content changes.

**KOR 110 (E-Z). Themes in Modern and Contemporary Culture of Korea (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores themes of modern and contemporary Korean literature and culture. M. History, Memory, and Nostalgia; T. Tradition of Social Criticism.

**KOR 112. Modern Korean Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of modern Korean literature from the colonial era to the present. Topics include colonialism; cultural influence and exchange; gender, family and sexuality; nation and nationalism; Confucian tradition and patriarchal culture; and modernization and capitalism. Cross-listed with AST 112.

## Southeast Asian Studies Courses

### Lower-Division Course

**SEAS 047. Introduction to Southeast Asian History (4)** Lecture, 3 hours; extra reading, 3 hours. Introduces major themes and events in Southeast Asian history. Covers from prehistory to contemporary events in the region. Develops basic historical approaches to understanding contemporary trends, such as the spread of world religions, regional differences and connections, trading patterns, cultural forms, and historically important sites. Cross-listed with AST 049 and HIST 046.

### Upper-Division Courses

**SEAS 145. Buddhism in Southeast Asia (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s):

RLST 106 or consent of instructor. Explores various texts, magical practices, forms of meditation, rituals, and beliefs of ancient and modern Buddhism, focusing on the ways in which they are transformed by nuns, monks, and the laity in Burma, Cambodia, Laos, Thailand, and California. Cross-listed with RLST 145.

**SEAS 162. Vietnamese Literary History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with AST 162, HIST 187, and VNM 162.

**SEAS 184. The Vietnam Wars (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Vietnamese history in the twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-*doi moi* society. Cross-listed with AST 160, HIST 184, and VNM 184.

**SEAS 185. Southeast Asia, Prehistory to 1800 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers the major Southeast Asian historical periods and cultures. Includes prehistory, classical kingdoms, and early modern trading states. Considers the role of ancient stories, religious systems, technologies, and art forms in forming traditional Southeast Asian identities, as well as the influences on these identities from outside the region. Cross-listed with AST 126 and HIST 185.

**SEAS 186. Modern Southeast Asia, 1800 to Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the formation of modern Southeast Asian nations and cultures since 1800. Compares colonial and postcolonial experiences in the region. Studies the formation of nationalist movements and the relationship of nationalist history with traditional and local histories. Considers the role of the individual, modern media, and global trade in the near-present. Cross-listed with AST 129 and HIST 186.

**SEAS 189. Encountering Vietnam (5)** Lecture, 6 hours; tutorial, 6 hours; project, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on literary and historical accounts of Vietnam. Utilizes translated travel writings from different genres and eras. Proficiency in Vietnamese not required. Taught in Vietnam and offered only in summer. Cross-listed with AST 189, HIST 189, and VNM 189.

## Graduate Courses

**SEAS 200. Topics in Southeast Asian Studies (4)** Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the world of Southeast Asia and the scholarly discussions about it, with an emphasis on cultural aspects, embedded in their historical context. Materials are in English. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPLT 200.

**SEAS 202. Southeast Asian Religions (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses different and dynamic aspects of religion in various

Southeast Asian countries, including Indonesia, Malaysia, Thailand, Cambodia, Vietnam, and the Philippines. Explores contextualized readings featuring historical, anthropological, literary, and other disciplinary perspectives on this diverse region. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topic changes up to 8 units.

**SEAS 203. Southeast Asian Cultures (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys ethnographic literature on Southeast Asian cultures, with an emphasis on contemporary research. Covers anthropological approaches to the study of text, ritual, and performance practices; intercultural dynamics; the impact of colonialism and nationalism on traditional cultures; and globalization. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ANTH 203.

**SEAS 204. Approaches to Southeast Asian History (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to central historical problems, historiographical debates, materials, and theoretical approaches in Southeast Asian history. Readings each week focus on a different theme. Course is repeatable to a maximum of 8 units. Cross-listed with HIST 242.

**SEAS 205. Literature of Southeast Asia (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores themes and theories related to understanding literature and literary culture in Southeast Asia, insisting that the space of literature reaches beyond the text to include all disciplines. Students critically read, engage in, and question discourses of nationhood, identity, loss, mourning, history, and memoir. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPLT 205.

**SEAS 206. Southeast Asian Diasporic Literature and Film (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the contemporary works by Southeast Asian immigrants within the United States and France. Emphasizes the concept that the dynamic production of culture is a negotiation of power and an expression of resistance. Provides an interdisciplinary framework by utilizing historical as well as theoretical works to contextualize the cultural productions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

**SEAS 243A. Seminar in Southeast Asian History (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses Southeast Asian topics from regional, comparative, and local perspectives. May be undertaken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned. After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with HIST 243A.

**SEAS 243B. Seminar in Southeast Asian History (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 243A/SEAS 243A. Discusses Southeast Asian topics from regional, comparative, and local perspectives. Students produce a substantial research paper that continues their work from HIST 243A/SEAS 243A. May be undertaken as a one-

or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with HIST 243B.

**SEAS 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor. Directed study to meet special curricular needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SEAS 292. Concurrent Analytical Studies in Southeast Asian Studies (1-4)** Individual study, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Taken concurrently with a 100-series course, but on an individual basis. Devoted to research, criticism, and written work at the graduate level related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SEAS 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): consent of instructor; graduate standing. Individualized research under the sponsorship of specific faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**SEAS 299. Research for the Thesis (1-12)** Thesis, 3-36 hours. Prerequisite(s): consent of thesis director. Research and preparation for the thesis. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Vietnamese Courses

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and [placementtest.ucr.edu](http://placementtest.ucr.edu) for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**VNM 001. Elementary Vietnamese (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Vietnamese placement examination. An introduction to the sound system and grammar of Vietnamese. Focuses on the development of the four skills: comprehension, speaking, reading, and writing. Classes are conducted in Vietnamese as often as possible. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

**VNM 002. Elementary Vietnamese (4)** Lecture, 4 hours. Prerequisite(s): VNM 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty. An introduction to the sound system and grammar of Vietnamese. Focuses on the development of the four skills: comprehension, speaking, reading, and writing. Classes are conducted in Vietnamese as often as possible. Credit is awarded for only one of the following

sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

**VNM 003. Elementary Vietnamese (4)** Lecture, 4 hours. Prerequisite(s): VNM 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty. An introduction to the sound system and grammar of Vietnamese. Focuses on the development of the four skills: comprehension, speaking, reading, and writing. Classes are conducted in Vietnamese as often as possible. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

**VNM 004. Intermediate Vietnamese (4)** Lecture, 4 hours. Prerequisite(s): VNM 003 with a grade of "C-" or better or VNM 020B with a grade of "C-" or better or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty. Emphasizes further development of vocabulary, reading, writing, comprehension, and speaking skills. Provides foundation for recognizing, formulating, and articulating complex ideas.

**VNM 005. Intermediate Vietnamese (4)** Lecture, 4 hours. Prerequisite(s): VNM 004 or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty. Emphasizes further development of vocabulary, reading, writing, comprehension, and speaking skills. Provides foundation for recognizing, formulating, and articulating complex ideas.

**VNM 020A. Beginning Vietnamese for Advanced Heritage Learners (4)** Lecture, 4 hours. Prerequisite(s): Student must take the Vietnamese placement examination. Structured for the heritage student at the beginning level who has advanced comprehension and some speaking skills. Focuses on developing language skills and improving existing reading and writing skills. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

**VNM 020B. Beginning Vietnamese for Advanced Heritage Learners (4)** Lecture, 4 hours. Prerequisite(s): VNM 020A with a grade of "C-" or better or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty. Builds upon course work covered in VNM 020A. Includes integrating situational lessons with vocabulary, sentence patterns, grammar, and socio-linguistics used in daily life. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

**VNM 064. Introduction to Vietnamese and Diasporic Film Culture (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Engages students in critical viewing strategies and analytical visual critique. Explores the revival of film production in Vietnam following the Vietnam War, with a focus on the means of production, state control, and international distribution. Readings are in translation; classes are conducted in English. Cross-listed with AST 064 and MCS 049.

## Upper-Division Courses

**VNM 101. Advanced Vietnamese (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): VNM 005 or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty or consent of instructor. Designed to develop fluency in Vietnamese to the level of intellectual conversation. Emphasis is on read-

ing and writing of Vietnamese literature and criticism, visual culture, and discussion of current issues of Vietnamese society.

**VNM 162. Vietnamese Literary History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with AST 162, HIST 187, and SEAS 162.

**Beevi Lam**

**VNM 164. Vietnamese American Culture (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the pervasive aspects of Vietnamese American culture, including shared histories, acculturation patterns, class diversity, identity struggles, community-building literary and cultural production, youth issues, and cultural survival. Introduces foundational literature, visual culture, and scholarship in the field. Cross-listed with AST 164.

**VNM 165 (E-Z). Themes in Vietnamese Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An exploration of Vietnamese literature in translation, as seen through the lens of a particular theme or issue. Segments pay particular attention to the implications of gender and sexuality on nation formation. All materials are read or viewed in English. E. Women and War. Cross-listed with AST 165 (E-Z) and WMST 165 (E-Z).

**VNM 166. Vietnam and the Philippines (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the comparative national histories of Vietnam and the Philippines by way of great literary works in various genres: poetry, short fiction, and novels. All materials are read in English. Cross-listed with AST 166 and CPLT 166.

**VNM 184. The Vietnam Wars (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Vietnamese history in the twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-*dai moi* society. Cross-listed with AST 160, HIST 184, and SEAS 184.

**VNM 189. Encountering Vietnam (5)** Lecture, 6 hours; tutorial, 6 hours; project, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on literary and historical accounts of Vietnam. Utilizes translated travel writings from different genres and eras. Proficiency in Vietnamese not required. Taught in Vietnam and offered only in summer. Cross-listed with AST 189, HIST 189, and SEAS 189.

## Civilization

### Committee in Charge

Sabine Doran, Ph.D. *Germanic Studies*  
Wendy J. Raschke, Ph.D. *Classics/Comparative Literature*  
Theda Shapiro, Ph.D. *French/Comparative Literature*  
Nicoletta Tinozzi Mehrmand, Ph.D. *Italian*  
Yang Ye, Ph.D. *Chinese/Civilizations/Comparative Literature*

Stephen E. Cullenberg, Ph.D.  
Dean, College of Humanities, Arts, and Social Sciences, *ex officio*

The Civilization concentration is available in French and Russian Studies. See specific requirements under each respective section.

## Lower-Division Courses

**EUR 017A. Introduction to European Literature and Culture (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. Examines great works of European literature from the Middle Ages through the Enlightenment in their historical and cultural context. Introduces basic methods for approaching literary works and cultural issues.

**EUR 017B. Introduction to European Literature and Culture (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. Examines great works of European literature from the French Revolution to the present in their historical and cultural context. Introduces basic methods for approaching literary works and cultural issues.

**EUR 026. New European Cinemas: Experiment and Innovation (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to a succession of New Waves in European Cinema: *Neorealism* in Italy, *New Wave* in France, and *New Cinema* in Germany, Russia, and Britain. Study of political engagements and technical innovations. Topics include the concept of the auteur, key manifestos, and attempts to define European cinema in film theory. Cross-listed with CPLT 026 and MCS 026.

**EUR 030 (E-Z). Themes in French Civilization (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. Examines major aspects of French and Francophone cultures through a study of their art history, history, literature, and ethnography. F. France and America; W. The Frenchwoman. No knowledge of French is necessary.

**EUR 042. Italian Americans: Voices and Visions (4)** Lecture, 1.5 hours; discussion, 1.5 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): none. A study of the Italian American experience as seen through major works of Italian and Italian American writers and filmmakers. Covers the 1950s to the present. No knowledge of Italian required. Cross-listed with ITAL 042.

**EUR 044. Mafia and Malavita in Italian Literature and Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of the history of malavita in the Italian peninsula. Explores topics from mischievous transgression to organized crime and Mafia, as presented through the works of renowned Italian writers and directors. No knowledge of Italian required. Cross-listed with ITAL 044.

**EUR 047. Introduction to Russian Culture (4)** Lecture, 3 hours; consultation, 1 hour. A multimedia introduction to Russian culture. Emphasis on Russian masterpieces in art, architecture, dance, theatre, literature, film, and music which are characteristic of the culture and life of their period. All work is done in English. Strongly recommended for Russian majors.

## Upper-Division Courses

**EUR 110A. Vienna: Sensuality and Seduction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Cultural study of Vienna from fin de siècle

to the present through literature, film, philosophy, and the visual arts. Topics include sexuality, visual desire, crisis of language, anti-Semitism, and the post-World War II confrontation with the Nazi period. All readings are in English; selected readings in German for German majors and minors. Cross-listed with CPLT 110A, GER 110A, and WMST 110.

**EUR 110B. Berlin Metropolis in Literature, Film, Music, and Art (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the metropolis Berlin as gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. A study of Berlin's dramatic transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course is conducted in English. Cross-listed with AHS 120, CPLT 110B, GER 110B, and MCS 178.

**EUR 111A. Survey of Russian Civilization (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers pre-twentieth century Russian music, architecture, and art. Any course within the EUR 111A, EUR 111B, and EUR 111C sequence may be taken independently. No knowledge of Russian is necessary.

**EUR 111B. Survey of Russian Civilization (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers Russian symbolism and the Great Emigration. Any course within the EUR 111A, EUR 111B, and EUR 111C sequence may be taken independently. No knowledge of Russian is necessary.

**EUR 111C. Survey of Russian Civilization (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers Soviet culture. Any course within the EUR 111A, EUR 111B, and EUR 111C sequence may be taken independently. No knowledge of Russian is necessary.

**EUR 112A. Survey of Germanic Cultures and Institutions (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers German civilization, 1750 to 1880. No knowledge of German is required.

**EUR 112B. Survey of Germanic Cultures and Institutions (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers German civilization, 1880 to the present. No knowledge of German is required.

**EUR 115 (E-Z). French Studies (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Varying topics relating to the literature, thought, and culture of France. Possible topics might include: the Paris mystique, French literary existentialism, individualism in the Renaissance. F: Paris; M: Medieval Women in France. No knowledge of French is necessary.

**EUR 116. Modern and Contemporary France: 1914-1958 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Interdisciplinary study of French society, culture, politics, and institutions. No knowledge of French is necessary.

**EUR 119 (E-Z). Topics in Italian Culture (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. In-depth study of major topics in Italian institutions, society, and culture. E. Contemporary Italy; M. Making of Italian Arts; R. Risorgimento: Birth of the Italian Nation; U. Italian Urban Culture. No knowledge of Italian is required.

**EUR 124. Nordic Mythology, Folklore, and Fairytales (4)** Seminar, 3 hours; extra reading, 1 hour;

written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the representation of animals, plants, and other appearances of the natural world such as sunrise and sunset in European creation and destruction mythology, fairytales, and folklore. Cross-listed with GER 124.

**EUR 137. Passions, Apparitions, and Automata (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of German Romanticism from its origins in Goethe to its development in Hoffmann. Topics include madness, sexual desire, doppelgänger, homicide, and *automata*. All readings are in English; selected readings are in German for German majors and minors. Cross-listed with CPLT 137 and GER 137.

**EUR 138. From Expressionism to Epic Theatre: Benn, Brecht, Kafka, and the Bauhaus (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction of the German avant-garde of the twentieth century. Explores expressionism, New Objectivity, the Bauhaus movement, the manifestation of an anti-art in dadaism, and Epic Theatre. Studies works of Franz Kafka in the context of his implicit criticism of the avant-gardist movements of his time. Course is conducted in English. Cross-listed with AHS 121, CPLT 138, GER 138, and MCS 182.

**EUR 192. Workshop in European Languages (1)** Workshop, 1 hour. Prerequisite(s): concurrent enrollment in an upper-division course in European literature or culture that is taught in English. Taken in conjunction with an upper-division course in European literature or culture, provides discussion and alternative assignments in the language of the student's emphasis. Course is repeatable to a maximum of 6 units.

## Classical Studies

### Committee in Charge

David Glidden, Ph.D., Acting Chair, (Philosophy)  
Jozef Muller, Ph.D. *Philosophy*  
Benjamin King, Ph.D., *Classics*  
Wendy J. Raschke, Ph.D. *Classics/Comparative Literature/Comparative Ancient Civilizations*  
Thomas F. Scanlon, Ph.D., Chair *Classics/Comparative Ancient Civilizations/Comparative Literature*  
Stephen E. Cullenberg, Ph.D.  
Dean, College of Humanities, Arts, and Social Sciences, *ex officio*

The objective of the B.A. in Classical Studies is the furthering of knowledge of classical civilization through two emphases: the study of Greek and/or Latin language(s) and literature(s) and the study of courses in English translation on topics including classical literature, history, politics, religion, mythology, and art in order to aid students' appreciation of the Greek and Roman contributions to later Western civilization.

The student who majors in Classical Studies acquires a balanced yet focused view of the language, literature, thought, and civilization of Greece and Rome. The student also obtains the valuable skills of a better vocabulary, a sharper critical sense, logical analysis of texts, coherent argumentation, and a valuable perspective on our own society. Classical Studies majors receive a liberal arts education of traditional excellence and one widely esteemed by business and professional schools. A student

may also pursue graduate training in Classics, Art History, History, Philosophy, or other related disciplines.

## Major

**Language Proficiency** All students in Classical Studies must complete either LATN 001, LATN 002, LATN 003, and LATN 004 (or equivalents) or GRK 001, GRK 002, and GRK 003 (or equivalents). They must also complete 12 upper-division units (or the equivalent) of course work in Latin or Greek.

- Language proficiency requirement:
  - either LATN 001, LATN 002, LATN 003, and LATN 004 (or equivalents) or GRK 001, GRK 002, and GRK 003 (or equivalents)
 and
  - Twelve (12) upper-division units or the equivalent of course work in Latin or Greek
- Civilization requirement  
Either two courses from CLA 010A, CLA 010B, CLA 010C or both CLA 027A and CLA 027B
- CPLT 015
- Twenty-four (24) units from the following:
  - Upper-division Latin or Greek literature courses beyond the language proficiency requirement
  - AHS 147, AHS 148, CLA 100/HISE 110, CLA 110 (E-Z)/LATN 110 (E-Z), CLA 112/CPLT 112/RLST 117, CLA 114/CPLT 114, CLA 120 (E-Z), CLA 165, CLA 190, GRK 190, LATN 190, PHIL 121Q, POSC 110, RLST 136, THEA 125E
  - Other courses outside the Classics program related to the major with approval of the student's advisor.

A highly recommended lower-division course is CLA 040 (Classical Mythology). In their course selection, students should seek exposure to both the Greek and Roman components of the major.

## Minor

The Classical Studies minor offers students a fundamental understanding of classical language and culture which form the basis of much of western civilization. The minor naturally complements liberal arts degrees in many areas, including History, Art History, Philosophy, English, and Religious Studies. Students profit from the skills associated with a degree in the classics, such as enhancement of analytical and critical abilities, communication skills, and verbal proficiency.

- One course from CLA 010A, CLA 010B, CLA 010C, CLA 027A, or CLA 027B
- Either LATN 001, LATN 002, LATN 003, and LATN 004 (or equivalents) or GRK 001, GRK 002, and GRK 003 (or equivalents)

- One upper-division course (4 units) in either Latin or Greek
- Three courses from among the following (12 units)
  - Greek at or above the 100 level
  - Latin at or above the 100 level
  - AHS 147, AHS 148, CLA 100/HISE 110, CLA 110 (E-Z)/LATN 110 (E-Z), CLA 112/CPLT 112/RLST 117, CLA 120 (E-Z), CLA 114/CPLT 114, CLA 165, CLA 190, GRK 190, LATN 190, PHIL 121Q, POSC 110, RLST 136, THEA 125E

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Classics

**Subject abbreviation: CLA**

### Lower-Division Courses

**CLA 010A. Ancient Civilization: Early Greece and the Mediterranean (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. A broad treatment of history, art and archaeology, and literature, read in translation, comprising a cultural survey of the origins and the first formation of Western civilization. **Raschke**

**CLA 010B. Ancient Civilization: Classical Greece (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. A broad treatment of history, art and archaeology, and literature, read in translation, comprising a cultural survey of the origins and the first formation of Western civilization. **Raschke**

**CLA 010C. Ancient Civilization: Rome (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. A broad treatment of history, art and archaeology, and literature, read in translation, comprising a cultural survey of the origins and the first formation of Western civilization. **Raschke**

**CLA 017. Rome: The Ancient City (4)** Lecture, 3 hours; extra reading, 3 hours. Traces the development of the city of ancient Rome. By studying the literary and historical evidence alongside the physical remains of the city—its monuments, art, and historical and archaeological remains—this course seeks to introduce students to the Romans and to their importance for later ages. Cross-listed with AHS 030 and HIST 027.

**CLA 020. Word Power from Greek and Latin Roots (4)** Lecture, 3 hours; consultation, 1 hour. An intensive study of Greek and Latin elements in English etymology and word derivation. No knowledge of Greek or Latin is necessary. **King, Scanlon**

**CLA 027A. Classical Literature in Translation: Love and Death (4)** Lecture, 3 hours; consultation, 1 hour. Selected readings in Greco-Roman epic, drama, lyric, history, and philosophy. **King, Raschke, Scanlon**

**CLA 027B. Classical Literature in Translation: Illusion and Reality (4)** Lecture, 3 hours; consultation, 1 hour. Selected readings in Greco-Roman epic, drama, lyric, history, and philosophy.

**CLA 030. Scientific Word Power from Latin and Greek Roots (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A systematic analysis of the scientific terminology in English derived from Greek and

Latin stems, including those in the biological and natural sciences. Aims are to teach word-analysis, to increase technical and taxonomic vocabulary, and to study our linguistic and cultural debt to Greek and Roman scientific language. **King**

**CLA 040. Classical Mythology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introductory survey of the mythology of Greece and Rome, including the divine myths, heroic legends, and the implications of these polytheistic systems for ancient culture. **King, Scanlon**

**CLA 045. The Ancient World in Film and Television (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of representations of Greece and Rome in film, television, and other modern media. Introduces these 'visual texts' both as popular art forms on their own and in relation to their ancient and modern literary sources. Cross-listed with MCS 038.

**CLA 050. Folktales, Monsters, and Magic in Ancient Greece and Rome (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Examines beliefs of the supernatural as part of life in the ancient world. Topics include magic and witchcraft, the fear of demons and ghosts, and the wish to manipulate invisible powers. Utilizes a variety of media and sources both ancient and modern.

### Upper-Division Courses

**CLA 100. Ancient Historians (4)** Lecture, 3 hours; outside research, 2 hours; term paper, 1 hour.

Prerequisite(s): upper-division standing or consent of instructor. The historical development of historiography as evidenced in ancient historical writings from Near Eastern king lists and biblical histories to the narrative histories of Greece and Rome. Focuses on the ideas of history in the various cultures of the ancient Near East and Mediterranean and their relation to modern historical thought. Cross-listed with HISE 110.

**CLA 102. Ancient Civilizations and Later Identities (4)** Lecture, 3 hours; outside research, 3 hours.

Prerequisite(s): upper-division standing or consent of instructor. Topical survey of aspects of ancient civilizations appropriated and re-applied to modern cultures. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPAC 102.

**CLA 110 (E-Z). Latin Literary Genres (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Readings and discussion of the principal genres of Classical Latin Literature. Attention is given to contemporary ancient critical theory, and its divergence from modern literary constructs. Includes analysis of primary ancient texts and modern scholarship. This course may meet certain college or major language requirements for those students who choose, with instructor's permission, to do select readings in Latin. E. Drama; J. Historical Literature. Cross-listed with LATN 110 (E-Z). **Raschke, Scanlon**

**CLA 112. Mythology (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religions viewed from a variety of theoretical perspectives. Includes material drawn from epics, religious texts, divine hymns, creation myths, heroic legends, and concepts of the afterlife as reflected in literary and nonliterary sources. Cross-listed with CPLT 112 and RLST 117.

**CLA 113. Comparative Ancient Historical Writing (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of

instructor. A survey of the literary aspects of historical writing in ancient cultures, with some comparison of the ancient contribution to later authors of the genre. Cross-listed with CPAC 112 and HISE 113.

**CLA 114. The Classical Tradition (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the legacy of Greece and Rome in Western culture, from the Renaissance to the present. Topics include literature, art, architecture, and politics. Cross-listed with CPLT 114. **King, Scanlon**

**CLA 120 (E-Z). Themes and Issues of the Classical World (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on an aspect of antiquity of critical importance to modern culture, and examines the relevant literary texts, artistic monuments, and cultural data. Students explore and interpret ancient sources to gain an appreciation of the differences and similarities between the classical world and the world today. All readings are in English; no knowledge of foreign languages is required. E. Ancient Sexuality and Gender: Myths and Realities; F. Greco-Roman Popular Culture. G. Reading Greek and Roman Sports.

**CLA 121. Monarchy (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious life. Cross-listed with CPAC 121 and POSC 121.

**CLA 131. Readings in the Origins of Science in China and Greece (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the ancient scientific traditions of China and Greece and compares to modern scientific categories. Includes ideas about nature, the body, and systematic accounts of the natural world. Cross-listed with AST 131, CHN 131, and CPAC 131.

**CLA 132. Medical Traditions in China and Greece (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative examination of the early development of Western medical traditions in classical Greece and the origins and development of the Chinese medical systems now referred to as traditional Chinese medicine, with specific attention to their cultural and social contexts. Cross-listed with AST 132, CHN 132, and CPAC 132.

**CLA 141. Militarism and Hegemony in the Ancient World (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with AST 145, CHN 141, CPAC 141, and POSC 140.

**CLA 165. Greco-Roman Cults and Credence (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the rich diversity of religious belief and systems of worship in the Greco-Roman world, from Bronze Age and Classical Greeks, to the Romans of the late Empire. Texts, documents, and archaeological evidence are examined to explore these unique constructions of ritual and creed. **Scanlon**

**CLA 190. Special Studies (1-5)** To be taken with the consent of the chairman of the department as a means of meeting special curricular problems or deficiencies. Course is repeatable.

## Graduate Courses

See also UC Tri-Campus Graduate Program in Classics.

**CLA 200A. Contemporary Literary Theory and the Classics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. An introduction to contemporary literary theory focusing on important critical approaches. Topics vary from year to year. Requires written work that explores theoretical issues and involves engagement with a Greek or Latin text. This work may, for example, illuminate some aspect of a theorist's work, put two theorists into dialogue, or explore the usefulness of a particular approach to texts, authors, or genres. Taught at UC Irvine. Same as UC Irvine CLASSIC 200A. Course is repeatable.

**CLA 200B. Diachronic Perspectives on Classical Antiquity (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Examines ways in which classical texts and ideas have been received and appropriated for the diverse purposes of ancient and subsequent cultures. Taught at UC Irvine. Same as UC Irvine CLASSIC 200B. Course is repeatable.

**CLA 200C. Greece and Rome in Their Contemporary Cultural Contexts (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. An introduction to the methods and perspectives of social scientific theory used to study the material and social dimensions of the ancient cultures of Greece and Rome. Taught at UC Irvine. Same as UC Irvine CLASSIC 200C. Course is repeatable.

**CLA 201. Research Methods in Classical Studies (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Covers various technical skills essential for successful research and pedagogy in Classics. Includes use of digital resources (e.g., bibliographical databases). Introduces important disciplinary subfields, such as textual criticism and epigraphy. Selection of topics is at the instructor's discretion. Taught at UC Irvine. Same as UC Irvine CLASSICS 201. Course is repeatable as topics change.

**CLA 250. Seminar in Classics (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Focuses mainly, but not exclusively, on major literary topics. Subject matter varies. Taught at UC Irvine. Same as UC Irvine CLASSIC 220. Course is repeatable.

**CLA 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor; normally open only to students in the UC Tri-Campus Graduate Program in Classics. Supervised independent research. Same as UC Irvine CLASSIC 280. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CLA 292. Concurrent Studies in Classics (2)** Individual study, 6 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Concurrent enrollment in an advanced undergraduate Greek or Latin course, with credit awarded for additional reading and separate examinations. Same as UC Irvine CLASSIC 205. Course is repeatable.

**CLA 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Research in preparation for the Candidacy Examination. Same as UC Irvine CLASSIC 290. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CLA 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Directed research for the M.A. thesis or Ph.D. dissertation. Same as UC Irvine CLASSIC 299. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**CLA 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Classics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Greek Courses

Subject abbreviation: GRK

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and [placementtest.ucr.edu](http://placementtest.ucr.edu) for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**GRK 001. Introduction to Classical Greek (4)** Lecture, 4 hours. Prerequisite(s): none. Intensive study of the fundamentals of Attic Greek with practice in reading and writing. **King**

**GRK 002. Introduction to Classical Greek (4)** Lecture, 4 hours. Prerequisite(s): GRK 001 with a grade of "C-" or better or equivalent. Intensive study of the fundamentals of Attic Greek with practice in reading and writing. **King**

**GRK 003. Introduction to Classical Greek (4)** Lecture, 4 hours. Prerequisite(s): GRK 002 with a grade of "C-" or better or equivalent. Intensive study of the fundamentals of Attic Greek with practice in reading and writing. **King**

## Upper-Division Courses

**GRK 101 (E-Z). Advanced Greek Reading and Grammar (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GRK 003 with a grade of "C-" or better or equivalent. One or two of the following will be offered every year, according to need. E. Homer *Iliad*; F. Homer *Odyssey*; G. Lyric Poets; H. Aeschylus; I. Sophocles; J. Euripides; K. Aristophanes; L.

Herodotus; M. Thucydides; N. Xenophon; O. The Attic Orators; P. Plato; Q. Aristotle; R. New Testament; T. Hellenistic and Later Greek.

**GRK 190. Special Studies (1-5)** To be taken with the consent of the instructor as a means of meeting special curricular problems. Course is repeatable.

## Graduate Courses

See also *UC Tri-Campus Graduate Program in Classics*.

**CPLT 290. Directed Studies (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CPLT 290 (E-Z). Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair. To be taken as a means of meeting special curricular needs in literature. E. English; F. French; G. German; H. Greek; I. Italian; J. Japanese; K. Chinese; L. Latin; M. Latin American; R. Russian; S. Spanish; T. Scandinavian; U. American; V. Slavic. Segments are repeatable.

**GRK 292. Concurrent Analytical Studies (2)** Outside research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in GRK 100-series course. To be taken on an individual basis. Each student completes a graduate paper based on research related to the GRK 100-series course. Course is repeatable.

## Professional Course

**CPLT 301. Teaching of Foreign Language at the College Level (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

## Latin Courses

**Subject abbreviation: LATN**

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and **placementtest.ucr.edu** for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**LATN 001. Introduction to Latin (4)** Lecture, 4 hours. Prerequisite(s): none. Intensive study of the fundamentals of the Latin language with practice in reading and writing.

**LATN 002. Introduction to Latin (4)** Lecture, 4 hours. Prerequisite(s): LATN 001 with a grade of "C-" or better or equivalent. Intensive study of the fundamentals

of the Latin language with practice in reading and writing.

**LATN 003. Introduction to Latin (4)** Lecture, 4 hours. Prerequisite(s): LATN 002 with a grade of "C-" or better or equivalent. Intensive study of the fundamentals of the Latin language with practice in reading and writing.

**LATN 004. Intermediate Latin (4)** Lecture, 3 hours; grammar study projects, 3 hours. Prerequisite(s): LATN 003 with a grade of "C-" or better or equivalent. Involves readings from Latin prose and poetry, accompanied by selective review of grammar and presentation of more advanced grammatical issues. Designed to complete the introductory sequence and to ease the transition to upper-division literature courses.

## Upper-Division Courses

**LATN 101 (E-Z). Advanced Latin Reading and Grammar (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): LATN 004 or equivalent. One or two of the following are offered every year according to need. E. Plautus; F. Terence; G. Virgil; H. Catullus; I. Horace; J. Ovid; K. Propertius; L. Tibullus; M. Sallust; N. Cicero; O. Livy; P. Tacitus; Q. Juvenal; R. Lucretius; S. Seneca; T. Pliny; U. Medieval Latin; V. Renaissance Latin.

**LATN 110 (E-Z). Latin Literary Genres (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Readings and discussions of the principal genres of Classical Latin literature. Attention is given to contemporary ancient critical theory, and its divergence from modern literary constructs. Includes analysis of primary ancient texts and modern scholarship. This course may meet certain college or major language requirements for those students who choose with instructor's permission to do select readings in Latin. E. Drama; J. Historical Literature. Cross-listed with CLA 110 (E-Z).

**LATN 135. The Roman Novel (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): LATN 004 or equivalent. Reading and discussion of Latin prose fiction as represented by Petronius' *Satyricon* and/or Apuleius' *Metamorphoses*. Emphasis given to the development of the romantic novel in Latin. **Raschke**

**LATN 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): LATN 004 or equivalent or consent of instructor. To be taken as a means of meeting special curricular problems. Course is repeatable.

**Scanlon**

## Graduate Courses

See also *UC Tri-Campus Graduate Program in Classics*.

**CPLT 290. Directed Studies (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CPLT 290 (E-Z). Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair. To be taken as a means of meeting special curricular needs in literature. E. English; F. French; G. German; H. Greek; I. Italian; J. Japanese; K. Chinese; L. Latin; M. Latin American; R. Russian; S. Spanish; T. Scandinavian; U. American; V. Slavic. Segments are repeatable.

**LATN 292. Concurrent Analytical Studies (2)** Outside research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in LATN 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to

the LATN 100-series course. Course is repeatable with different topic.

## Professional Course

**CPLT 301. Teaching of Foreign Language at the College Level (4)** Lecture, 3 hours; term paper, 3 hours.

Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

## The UC Tri-Campus Graduate Program in Classics

[web2.hnet.uci.edu/classics/tricampus](http://web2.hnet.uci.edu/classics/tricampus)

**(UC Irvine, UC Riverside, UC San Diego)**

The UC Tri-Campus Graduate Program in Classics is a joint venture that combines faculty in Classics and related disciplines from the three southernmost UC campuses.

Students accepted into the program may enroll at any of the three campuses, but they normally apply for admission to the Tri-Campus program through UC Irvine, which is the main location for instruction and administration. Applications to the Tri-Campus program are reviewed by an admissions committee composed of faculty members from all three campuses.

The goal of the program is to provide a graduate education that unites the main currents of modern literary, cultural, and social-scientific theory with the traditional skills and methodologies of classical philology. Candidates for degrees must exhibit facility in Greek and Latin, competence in research, including theoretical approaches to texts and objects, technical mastery of computing for research and teaching, and experience in teaching.

These goals are realized through the four core courses (CLA 200A, CLA 200B, CLA 200C, and CLA 201), seminars (UC Riverside CLA 250/UC Irvine CLASSICS 220) and reading courses (UC Riverside CLA 292/UC Irvine CLASSICS 205).

All students are admitted into the Ph.D. program. With the exception of those granted advanced standing because they hold the M.A. degree in Classics from another institution, entering students are concurrently enrolled in the M.A. program.

## Master's Degree

Students are admitted into the Ph.D. program only. Entering students who do not already hold a master's degree in Classics from another institution will be required to complete M.A. requirements while pursuing the Ph.D.

The requirements for the M.A. degree in Classics are two years (six quarters) of course work, passage of a special set of examinations, and completion of a master's paper. The normal course load is three 200-level courses each quarter. Minimum course requirements are four quarters of CLA 200A, CLA 200B, CLA 200C, and CLA 201; four quarters of UC Riverside CLA 292/UC Irvine CLASSICS 205; and four quarters of UC Riverside CLA 250/UC Irvine CLASSICS 220. (UC Riverside CLA 290/UC Irvine CLASSICS 280 may be substituted for these courses at the discretion of the faculty.) Requires a reading knowledge of either Germanic Studies, French, Italian, or equivalent language, demonstrated by examination or other means.

**Normative Time to Degree** Two years

## Doctoral Degree

The requirements for the Ph.D. degree in Classics are three years (nine quarters) of course work. Minimum course requirements are four quarters of CLA 200A, CLA 200B, CLA 200C, and CLA 201; five quarters of UC Riverside CLA 292/UC Irvine CLASSICS 205; and six quarters of UC Riverside CLA 250/UC Irvine CLASSICS 220 or an equivalent course. (UC Riverside CLA 290/UC Irvine CLASSICS 280 may be substituted for these courses at the discretion of the Program faculty.) Students are encouraged to take courses and seminars in relevant areas outside the program at any of the three campuses.

Students must demonstrate reading proficiency in a second modern language by the end of the third year. By the end of the third year and during the fourth year of study, students must have read extensively in the primary texts and in literary history and theory and in ancient history. To qualify as a candidate and enter the dissertation stage, a student must pass an individually designed set of qualifying examinations, including translation examinations in Greek and Latin, written examinations or lengthy papers in special authors and field, and an oral examination.

The facilities, course offerings, programs, and individual faculty mentorship of all three campuses are available to students in the Tri-Campus degree program. The resources of the program are enhanced through a cooperative teaching arrangement among the Tri-Campus program and the Classics graduate programs of UC Los Angeles and the University of Southern California.

**Foreign Language Requirement** Students must demonstrate reading proficiency in a second modern language by the end of the third year.

**Teaching Requirement** Experience in supervised teaching and/or research activity is normally required.

**Normative Time to Degree** Six years

## Faculty

Michele Salzman, Ph.D. Director  
Professor of History, UCR; Late Antiquity; Roman

History and Literature, Religion, Women's Studies  
Georgios Anagnostopoulos, Ph.D.  
Professor of Philosophy, UCSD; Ancient Greek  
Philosophy, Ethics, Metaphysics

Luci Berkowitz, Ph.D.  
Professor Emerita of Classics, UCI; Greek Literary  
History, Computer Application to Literature  
Charles Chamberlain, Ph.D. Lecturer in Classics and  
Comparative Literature, UCSD; Greek and Latin  
Literature, Aristotle, Poetics

Cynthia L. Claxton, Ph.D.  
Lecturer in Classics, and graduate teaching super-  
visor, UCI; Greek prose, Historiography

Page duBois, Ph.D.  
Professor of Classics and Comparative Literature,  
UCSD; Greek Literature, Rhetoric, Critical Theory,  
Cultural Studies

Anthony Edwards, Ph.D.,  
Associate Professor of Classics and Comparative  
Literature; Program Director, UCSD; Epic, Greek  
Comedy, Critical Theory

Leslie Collins Edwards, Ph.D.  
Lecturer in Classics and Comparative Literature,  
UCSD; Homer, Greek Drama, Education in Ancient  
Greece

Richard I. Frank, Ph.D.  
Associate Professor Emeritus of History and  
Classics, UCI; Roman history, Latin Elegy and  
Satire, Classical Tradition

Zina Giannopoulou, Ph.D.  
Assistant Professor of Classics, UCI; literary theory  
and Platonic hermeneutics, classical and  
Hellenistic philosophy, Greek tragedy and epic.

David Glidden, Ph.D.  
Professor of Philosophy, UCR; Greek and Roman  
Philosophy

Max Goldman, Ph.D.  
Lecturer in Classics, UCI; Latin poetry, ancient  
novel, literary criticism

Anna Gonosová, Ph.D.  
Associate Professor of Art History, UCI; Byzantine  
and Medieval Art

Benjamin King, Ph.D.  
Lecturer in Classics, UCR; Greek Literature and  
Philosophy

Edward N. Lee, Ph.D.  
Professor Emeritus of Philosophy, UCSD; Greek  
Philosophy, Plato

Marianne McDonald, Ph.D.  
Professor of Theatre and Classics, UCSD; Greek  
and Roman Theatre, Ancient Drama in Modern  
Plays, Film, and Opera

Margaret M. Miles, Ph.D.  
Associate Professor of Art History, UCI; Greek  
and Roman Art and Archaeology, Ancient Sicily,  
Greek Religion

Alden A. Mosshammer, Ph.D., Emeritus,  
Professor of History, UCSD; Early Christian  
Thought, Greek Chronography, Early Greek History

Sheldon Nodelman, Ph.D.  
Associate Professor of Visual Arts, UCSD; Classical  
Art and Architecture, Roman Portraiture, Critical  
Theory

Maria C. Pantelia, Ph.D.  
Associate Professor of Classics, and Director,  
Thesaurus Linguae Graecae, UCI; Greek Epic  
Poetry, Hellenistic Poetry, Computer Applications to  
Classics

Lisa Raphals, Ph.D.  
Professor of Chinese/Comparative Literature, UCR

Wendy J. Raschke, Ph.D.  
Lecturer in Classics, UCR; Roman Satire, Greek  
Art and Archaeology

B. P. Reardon, D.U.  
Professor Emeritus of Classics, UCI; Late Greek  
Literature, Ancient Novel

Gerasimos Santas, Ph.D.  
Professor of Philosophy, UCI; Ancient Philosophy,  
History of Philosophy, Ethics

Thomas F. Scanlon, Ph.D.  
Professor of Classics, UCR; Greek and Roman  
Historiography, Ancient Athletics

Gary Shiffman, Ph.D.  
Assistant Professor of Political Science, UCSD;  
Greek Political Theory

Patrick Sinclair, Ph.D.  
Associate Professor Emeritus of Classics, UCI;  
Roman Historiography, Latin Lexicography, Rhetoric

Dana F. Sutton, Ph.D.  
Professor Emeritus of Classics, UCI; Greek and  
Latin drama, Greek poetry, Anglo-Latin Literature

Nicholas White, Ph.D.  
Professor of Philosophy and Classics, UCI; ancient  
philosophy, ethics, epistemology/metaphysics

Eliot Wirshbo, Ph.D.  
Lecturer in Classics and Comparative Literature,  
UCSD; Greek Epic, Folklore

Andrew Zissos, Ph.D.  
Associate Professor of Classics; graduate advisor,  
UCI; Latin Epic; Medieval Latin; Roman Culture

## Graduate Courses

*Most of the following courses are taught  
at the UC Irvine campus.*

*See also CLA 302 under the Classics section.*

**CLA 200A. Contemporary Literary Theory and the Classics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. An introduction to contemporary literary theory focusing on important critical approaches. Topics vary from year to year. Requires written work that explores theoretical issues and involves engagement with a Greek or Latin text. This work may, for example, illuminate some aspect of a theorist's work, put two theorists into dialogue, or explore the usefulness of a particular approach to texts, authors, or genres. Taught at UC Irvine. Same as UC Irvine CLASSICS 200A. Course is repeatable.

**CLA 200B. Diachronic Perspectives on Classical Antiquity (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Examines ways in which classical texts and ideas have been received and appropriated for the diverse purposes of ancient and subsequent cultures. Taught at UC Irvine. Same as UC Irvine CLASSICS 200B. Course is repeatable.

**CLA 200C. Greece and Rome in Their Contemporary Cultural Contexts (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. An introduction to the methods and perspectives of social scientific theory used to study the material and social dimensions of the ancient cultures of Greece and Rome. Taught at UC Irvine. Same as UC Irvine CLASSICS 200C. Course is repeatable.

**CLA 201. Computing in Classical Studies (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. An introduction to the latest methods of computing for research and teaching. Taught at UC Irvine. Same as UC Irvine CLASSICS 201. Course is repeatable.

**CLA 250. Seminar in Classics (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Focuses mainly, but not exclu-

sively, on major literary topics. Subject matter varies. Taught at UC Irvine. Same as UC Irvine CLASSICS 220. Course is repeatable.

**CLA 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor; normally open only to students in the UC Tri-Campus Graduate Program in Classics. Supervised independent research. Same as UC Irvine CLASSICS 280. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CLA 292. Concurrent Studies in Classics (2)** Individual study, 6 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Concurrent enrollment in an advanced undergraduate Greek or Latin course, with credit awarded for additional reading and separate examinations. Same as UC Irvine CLASSICS 205. Course is repeatable.

**CLA 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Research in preparation for the Candidacy Examination. Same as UC Irvine CLASSICS 290. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CLA 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Directed research for the M.A. thesis or Ph.D. dissertation. Same as UC Irvine CLASSICS 299. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Comparative Ancient Civilizations

**Subject abbreviation: CPAC**

### Committee in Charge

Thomas Scanlon, Ph.D., Chair (Comparative Literature & Foreign Languages)  
 Wendy Ashmore (Anthropology)  
 Christopher Chase-Dunn (Sociology)  
 Lucile Chia (History)  
 David Glidden (Philosophy)  
 John Laursen (Political Science)  
 Hendrick Maier (Comparative Literature & Foreign Languages)  
 Vivian Nyitray (Religious Studies/Comparative Literature & Foreign Languages)  
 Thomas Patterson (Anthropology)  
 Wendy Rashke (Comparative Literature & Languages)  
 Michele Salzman (History)  
 Karl Taube (Anthropology)  
 Sabine Thuerwächter (Comparative Literature & Foreign Languages)  
 Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

The Comparative Ancient Civilizations B.A. combines the breadth of an interdisciplinary major with the focus of more traditional majors like History or Classical Civilization. By undertaking a comparison of several major cultures of the past that have continued importance in the construction of our present world, the program affords a truly liberal education. Students have a unique opportunity to employ the methods of humanities and social sciences in their

major study. They acquire skills of historical and social analysis, multicultural awareness, insight into constructions of gender and sexuality, and mental flexibility.

The major is an excellent choice as a double major taken along with any of the traditional disciplines to add distinction and intellectual breadth to one's background.

## Major

- Lower-division requirements (12 units):  
 Choose from ANTH 003, ANTH 004, CHN 030/AST 030, CLA 010A, CLA 010B, CLA 010C, CPAC 001, CPAC 002, CPLT 017A
- Upper-division requirements (44 units)
  - At least 16 units from CPAC 102/CLA 102, CPAC 112/CLA 113/HISE 113, CPAC 121/CLA 121/POSC 121, CPAC 131/AST 131/CHN 131/CLA 131, CPAC 132/AST 132/CHN 132/CLA 132, CPAC 133/HISE 114, CPAC 134/HIST 110, CPAC 141/CHN 141/CLA 141/AST 145/POSC 140
  - The balance from any of the following upper-division courses in related disciplines; students are recommended, in consultation with their advisor, to focus on one or two ancient civilizations in related courses to obtain special depth in those areas. Since related course offerings in these areas are often added, some of the most recent courses acceptable to fulfill this requirement may not be listed and students are advised to consult with the major advisor.

### Anthropology

ANTH 102/AHS 102 (Anthropology of Art)  
 ANTH 110 (Prehistoric Agriculture)  
 ANTH 117A (History of Old World Archaeology)  
 ANTH 117B (History of New World Archaeology)  
 ANTH 162 (Culture and Medicine)  
 ANTH 171 (Field Course in Maya Archaeology)

### Art History

AHS 102/ANTH 102 (Anthropology of Art)  
 AHS 144/AST 144 (Japanese Painting: Twelfth to Nineteenth Centuries)  
 AHS 146/AST 147 (The Japanese House)  
 AHS 147 (The Art of Greece)  
 AHS 148 (The Art of Rome)  
 AHS 155 (Early Christian Art)

### Asian Studies

AST 136/CHN 136 (Family and Gender in the Chinese Short Story)  
 AST 142/CHN 142/RLST 142 (Chuang-tzu)  
 AST 144/AHS 144  
 AST 147/AHS 146  
 AST 148/CHN 148 (Chinese Poetry and Poetics in Translation)

### Chinese

CHN 142/AST 142/RLST 142  
 CHN 148/AST 148

### Classics

CLA 100/HISE 110 (Ancient Historians)  
 CLA 110 (E-Z)/LATN 110 (E-Z) (Latin Literary Genres)  
 CLA 112/CPLT 112/RLST 117 (Mythology)  
 CLA 113/CPAC 112/HISE 113  
 CLA 114/CPLT 114 (The Classical Tradition)  
 CLA 120 (E-Z) (Themes and Issues of the Classical World)  
 CLA 121/CPAC 121/POSC 121  
 CLA 131/CPAC 131/AST 131, CHN 131  
 CLA 132/CPAC 132/AST 132/CHN 132  
 CLA 141/CPAC 141/AST 145/CHN 141/POSC 140  
 CLA 165 (Greco-Roman Cult and Credence)

### Comparative Literature

CLA 112/CPLT 112/RLST 117  
 CLA 114/CPLT 114

### English

ENGL 100 (Scriptures, Myth, and Interpretation)  
 ENGL 149 (Old English Literature)  
 ENGL 151A (Middle English Literature: 1066-1500)  
 ENGL 151B (Middle English Literature: Later Fourteenth Century)

### Ethnic Studies

ETST 115 (E-Z)/HISA 144 (E-Z) (Topics in American Indian History)

### Greek

GRK 101 (E-Z) (Advanced Greek Reading and Grammar)

### History

HISA 144 (E-Z)/ETST 115 (E-Z) (Topics in Native American History)  
 HISE 110/CLA 100 (Ancient Historians)  
 HISE 115 (The Roman Republic)  
 HISE 116 (The Roman Empire)  
 HISE 117 (Decline and Fall of the Roman Empire)  
 HISE 130/RLST 135 (History of Christianity)  
 HISE 150 (Ancient and Medieval England)  
 HISE 171 (Early Russia)  
 HIST 103 (History of Science from Antiquity to Copernicus)  
 HIST 110/CPAC 134 (History of Ancient Astronomy)  
 HIST 180 (Early Traditional China)  
 HIST 181 (Late Traditional China)

### Japanese

JPN 151/AST 151 (Early Japanese Literature)

### Latin

LATN 101 (E-Z) (Advanced Latin Reading and Grammar)  
 LATN 110 (E-Z)/CLA 110 (E-Z)  
 LATN 135 (The Roman Novel)

### Philosophy

PHIL 120 (E-Z) (Ancient Philosophy)  
 PHIL 122E (Topics in the History of Philosophy: Ancient Philosophy)

### Political Science

POSC 110 (The Origins of Our Political Ideas)

### Religious Studies

RLST 101 (Religions of India)

RLST 103 (Confucianism)  
 RLST 105 (Religions of Japan)  
 RLST 106 (Buddhism)  
 RLST 107 (Taoist Traditions)  
 RLST 111 (Islam)  
 RLST 117/CLA 112/CPLT 112 (Mythology)  
 RLST 121 (The Hebrew Bible/Old Testament)  
 RLST 124 (E-Z) (Studies in Judaism from 70 C.E. to the Modern Period)  
 RLST 128E (Contemporary Views of Jesus)  
 RLST 130 (Bible: New Testament)  
 RLST 131 (Jesus)  
 RLST 135 (History of Christianity)  
 RLST 136 (Augustine and Aquinas)  
 RLST 142/AST 142/CHN 142 (Chuang-tzu)

### Sociology

SOC 123 (Human Societies)

## Lower-Division Courses

**CPAC 001. Comparative Ancient Civilizations: An Introduction (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. An introduction to the comparative study of ancient civilizations of the world, their origins and development, some of the common traits and themes of world civilizations, and some of the unique qualities of particular cultures. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**CPAC 002. Ancient Civilizations and Modern Identities: An Introduction (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. Asks how people conceptualize ancient civilization and make claims to it as a source of their cultural heritage. By examining a number of exemplary cases, explores ways in which the idea of an ancient civilization in either the East or the West, the "Old World" and the "New," is constructed, assimilated, and appropriated by later times and other cultures *inter alia* for political empowerment and cultural legitimation. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

## Upper-Division Courses

**CPAC 102. Ancient Civilizations and Later Identities (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topical survey of aspects of ancient civilizations appropriated and re-applied to modern cultures. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CLA 102. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**CPAC 112. Comparative Ancient Historical Writing (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the literary aspects of historical writing in ancient cultures, with some comparison of the ancient contribution to later authors of the genre. Cross-listed with CLA 113 and HISE 113. *See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.*

**CPAC 121. Monarchy (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious

life. Cross-listed with CLA 121 and POSC 121. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**CPAC 131. Readings in the Origins of Science in China and Greece (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the ancient scientific traditions of China and Greece and compares to modern scientific categories. Includes ideas about nature, the body, and systematic accounts of the natural world. Cross-listed with AST 131, CHN 131, and CLA 131. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**CPAC 132. Medical Traditions in China and Greece (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative examination of the early development of Western medical traditions in classical Greece and the origins and development of the Chinese medical systems now referred to as traditional Chinese medicine, with specific attention to their cultural and social contexts. Cross-listed with AST 132, CHN 132, and CLA 132. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**CPAC 133. Ancient Writing and Literacy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Uses cross-cultural comparison to survey writing and literacy in ancient civilizations and how they are related in the origin and development of selected ancient cultures. Cross-listed with HISE 114. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**CPAC 134. History of Ancient Astronomy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins and history of ancient astronomy from Mesopotamia to the Greco-Roman world. Topics include the problems of the calendar and planetary motion, and the relation between astronomy and astrology in the ancient world. Focuses on readings from primary texts. Cross-listed with HIST 110. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**CPAC 141. Militarism and Hegemony in the Ancient World (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with AST 145, CHN 141, CLA 141, and POSC 140. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

## Comparative and World Literature

**Subject abbreviations: CPLT**

### Committee in Charge

Thomas F. Scanlon, Ph.D. Chair, *Classics/Comparative Ancient Civilizations/Comparative*

### Literature

Michelle E. Bloom, Ph.D. *Comparative Literature/French*  
 Heidi Brevik-Zender, Ph.D. *Comparative Literature/French*  
 David K. Danow, Ph.D. *Russian/Comparative Literature*  
 Sabine Doran, Ph.D. *European Literature/Comparative Literature*  
 Stephanie B. Hammer, Ph.D. *Comparative Literature/Germanic Studies*  
 John N. Kim, Ph.D. *Germanic Studies/Japanese/Comparative Literature*  
 Mariam Beevi Lam, Ph.D. *Vietnamese/Comparative Literature*  
 Margherita Long, Ph.D. *Japanese/Comparative Literature*  
 Hendrik M.J. Maier, Ph.D., *Southeast Asian Literature/Comparative Literature*  
 Lisa A. Raphals, Ph.D. *Chinese/Comparative Literature*  
 Jeffrey Sacks, Ph.D. *Arabic Literature/Comparative Literature*  
 Theda Shapiro, Ph.D. *French/Comparative Literature*  
 Marguerite Waller, Ph.D. *Italian/Women's Studies/Comparative Literature*  
 Yenna Wu, Ph.D. *Chinese/Civilizations/Comparative Literature*  
 Yang Ye, Ph.D., *Chinese/Comparative Literature*  
 Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

The department offers the B.A. in Comparative Literature. Comparative Literature is an interdisciplinary field which is studied internationally. At UCR, the Comparative Literature curriculum is organized around a core staff of comparatists assisted by qualified faculty from other departments and programs. The discipline of Comparative Literature encourages study of interliterary relationships among various cultural traditions; on the graduate level, it seeks to promote the study of interdisciplinary relationships. Comparative Literature courses, undergraduate or graduate, require that the majors read whenever possible in the languages (two for undergraduates, one of which may be English, and three for graduates) they present. Nonmajors may do all the readings in English translations. Comparative Literature majors may also work with translations.

Comparative Literature and World Literature courses are open to all students.

## Languages and Literatures/Comparative Literature

- Lower-division requirements (20 units plus proficiency)
  - Proficiency in at least one language (besides English), ancient or modern, through the intermediate level (second year)
  - CPLT 001 or CPLT 001W, CPLT 002
  - CPLT 017A, CPLT 017B, CPLT 017C
- Upper-division requirements (52 units)
  - Sixteen (16) units in one literature, distributed as much as possible among courses representing the various literary periods

- b) Twelve (12) units in a second literature
- c) CPLT 110, CPLT 193, (CPLT 196 strongly recommended but not required)
- d) Sixteen (16) elective units in Comparative Literature

Students contemplating graduate study in Comparative Literature are urged to complete two years in a second (non-English) language before graduation.

## Graduate Programs

The Department of Comparative Literature and Foreign Languages grants graduate degrees based on the comparative studies of world literatures and cultures. The Ph.D. degree has three tracks: Interliterary Studies, Interdisciplinary Studies, and Science Fiction, Science, and Literature described below. The department faculty, well balanced between Asianists and Europeanists, share a strong commitment to the study of literature through comparative and interdisciplinary approaches. We have particular strengths in comparative Asian and European studies; comparative ancient studies; gender and feminist studies; global cultures and post-colonialism; film and visual culture studies; narrative and cultural translation; and science and science fiction.

Students are admitted into the Ph.D. program only. Entering students who do not already hold a master's degree in Comparative Literature, in literature, or in comparable fields from another institution must complete M.A. requirements while pursuing the Ph.D.

**Admission** All applicants must supply GRE General Test (verbal, quantitative, analytical) scores.

**S/NC Courses** No S/NC-graded courses may be applied toward the minimum unit requirement for the graduate degree(s).

**Note** Courses in the student's special literature areas used to fulfill either the M.A. or Ph.D. literature requirements may be either graduate courses, or undergraduate courses together with a concurrent 292 course.

**Language Requirement** Students must have attained at least advanced language competency in their non-English areas of literary specialization. Competency is demonstrated by one of the following for each language required for a student's particular literary specializations:

1. **Course Work** A translation seminar with additional work in a specific national language/literature as required by the instructor.
2. **Translation Examination** A translation exercise from the foreign language into English with use of only a dictionary administered on campus and about two hours long. Period and genre should be discussed in advance with the examiner. The choice of examiner is approved by the graduate advisor.

## Master's Degree

The Department of Comparative Literature and Foreign Languages requires the following for the M.A. degree in Comparative Literature.

All students must complete a minimum of 36 units of course work. Candidates must work in three of the following literatures, or two literatures for students in the interdisciplinary track: Chinese, English (either British or American), French, German, Classical Greek, Italian, Indonesian, Japanese, Latin, Philippino, Portuguese, Russian, Spanish, and Vietnamese.

Requirements are as follows:

1. Two courses in canonical literature (CPLT 210)
2. Two courses in methods and theory (CPLT 214 and CPLT 215A)
3. One course from CPLT 212, CPLT 222, or CPLT 301
4. Two graduate courses in each of three literatures or in each of two literatures and one interdisciplinary area
5. Three elective courses in Comparative Literature

**Note** Students must take at least one graduate course in each of the following four areas: European, Asian, Ancient, and Modern Literature.

After completing the course requirements, the student has two options:

- a) Submit a portfolio of three essays, each one representing one of their three literary or interdisciplinary areas, and write a 750-1000 word commentary explaining the aims and achievements of the essays in relation to one another.
- b) Write a comprehensive research paper (40-50 pages) that incorporates their three interliterary or interdisciplinary areas; this paper may develop topics of previous papers, or explore a new topic area.

The student then undergoes oral examination on the portfolio or the research paper. Following the examination, the graduate committee, after evaluation of the student's entire graduate record, determines the candidate's suitability for continuing in the Ph.D. program.

## Doctoral Degree

The Department of Comparative Literature and Foreign Languages offers the Ph.D. degree in Comparative Literature with three tracks: Interliterary Studies, Interdisciplinary Studies, and Science Fiction, Science, and Literature. Areas of particular strength in the Interdisciplinary Studies are comparative Asian and European studies; comparative ancient civilizations; gender and feminist studies; global cultures and post-colonialism; film and visual culture studies; narrative and cultural translation; and science and science fiction.

**Interliterary Studies** This program is designed for students wishing to concentrate in Comparative Literature as an interliterary discipline. Students examine the relation among various national literatures. They are expected to work in three of the following literatures: Chinese, English (either British or American), French, German, Classical Greek, Italian, Indonesian, Japanese, Latin, Portuguese, Russian, Spanish, and Vietnamese. Permission is granted in exceptional cases to work in other literatures related to the Germanic, Romance, or Slavic families, in Hebrew or Arabic literature, in other Asian Literatures, and the literatures of Africa.

Students must obtain comprehensive knowledge of their first literature (the major specialty), in its language, literary history, and critical scholarship. In their two other literatures, they specialize in a genre, a period, critical school or theoretical approach, always in combination with their main literature. Work in the three literatures must be done in the languages of these literatures.

Students entering the interliterary Ph.D. program with an M.A. in literature must take two courses from the canons (CPLT 210), CPLT 214, and CPLT 215A (or demonstrate having taken similar courses).. Course requirements are two graduate courses in a first literature, two graduate courses in a second literature, two graduate courses in a third literature, and three additional elective graduate courses in Comparative Literature.

**Note** Students must take at least one graduate course in each of the following four areas: European, Asian, Ancient, and Modern Literature.

Students entering the interliterary Ph.D. program with an M.A. in another discipline must do course work equivalent to the M.A. degree in Comparative Literature while proceeding with course work for the Ph.D. program.

**Interdisciplinary Studies** This program is designed for students with interests in interdisciplinary studies. Students examine relationships between literary studies and other disciplines (such as art, ethnic studies, film, history, law, music, philosophy, political science, psychology, religious studies, science, sociology, theater). Students complete the literary requirements of the program but substitute an appropriate discipline for one of the second or third literatures. This option is recommended to students who enter Comparative Literature with an M.A. in a non-literary discipline.

Students entering the interdisciplinary studies Ph.D. program with an M.A. in any discipline must take two courses from the canons (CPLT 210), as well as CPLT 214 and CPLT 215A (or demonstrate having taken similar courses). In addition, course requirements are two graduate courses in each of two literatures; two courses in another discipline; and three elective graduate courses in Comparative Literature. The graduate advisor may require appropriate courses on an individual basis.

**Note** Students must take at least one graduate course in each of the following four areas: European, Asian, Ancient, and Modern Literature.

**Science Fiction, Science, and Literature** This option is designed for students with interests in science fiction studies and the relations of science to world literature. It builds upon the current widespread interest in Science Fiction and draws on the Eaton Collection. The program is intended for students who have already completed an undergraduate degree in Comparative Literature, English or kindred studies. It draws on the speculative richness of science fiction literature in a wide variety of social contexts, including the role of science in society (genetic engineering, artificial environments, nanotechnology, etc.), race and ethnicity, and social ethics. This track interacts with existing programs in the humanities, arts, social sciences and sciences. It is inherently cross-disciplinary both within the humanities, and between the humanities and sciences.

Students entering the Science Fiction, Science, and Literature Ph.D. program with an M.A. in any discipline must take courses from the following areas:

1. Three theory courses from among CPLT 214, CPLT 215A, and CPLT 210 (repeatable).
2. Three science, science fiction theory, literature and methods courses, including CPLT 272, CPLT 273, CPLT 274, CPLT 275.
3. One history of science course, (PHIL 237, PHIL 239, CHN/CLA 231, CHN/CLA 232, CPAC 134)
4. One course in Film and Media Studies (SOC 211, CPLT 174, CPLT 173, MCS 175, MCS 139, MCS 146)
5. One course in Philosophy or Religion from among either PHL 234, PHIL 237, PHIL 238 and PHIL 239 -- or RLST 200A, RLST 200C, and RLST 224)
6. One course in Social Sciences (ANTH 261, ANTH 277, ANTH 279, CHN/CLA 141, SOC 247, SOC 261, SOC 281)
7. Three elective courses from any of the groups listed above.

Among all the various courses selected there must be at least one course on non-Western materials and two graduate literature courses with readings in the original language in each of the student's two language areas. Language areas include: Arabic, Chinese, English, French, German, Classical Greek, Italian, Indonesian, Japanese, Latin, Filipino, Portuguese, Russian, Spanish, and Vietnamese. The graduate advisor may require appropriate courses on an individual basis. When taking any upper-division undergraduate course listed here, the student must enroll in a 292 course.

**Teaching Requirement** Normally some teaching experience is required; such experience is obtained through a teaching assistantship whereby a student is assigned either to Comparative Literature or to another program.

Students are strongly recommended to take one of the pedagogy courses in the department (CPLT 222 or CPLT 301) which may be used as one of their required elective courses.

**Written and Oral Qualifying Examinations** The written qualifying examination consists of the following:

1. For a student in the track of Interliterary Studies, the examination consists of four parts, which include the three national literatures that the student specializes in, with a comparative perspective, and on critical theory.
2. For a student in the track of Interdisciplinary Studies, the examination consists of four parts, which include two national literatures and one non-literary discipline that the student specializes in, with a comparative perspective, and on critical theory.

Prior to the examination for either track, students in consultation with the designated members of their committee, formulate a Special Reading List based on available departmental reading lists for each of the four parts that reflects the student's chosen fields of study and research and provides a basis for the examination.

Each of the four parts of the written examination for either the Interliterary or the Interdisciplinary Track is a three-hour exam.

The written examinations are followed by an oral qualifying examination.

#### **Dissertation and Final Oral Examination**

Candidates must write a dissertation on a topic approved by the dissertation committee and may be required to successfully undergo an oral examination on the dissertation.

**Normative Time to Degree** 18 quarters

## Lower-Division Courses

**CPLT 001. Introduction to Close Reading (4)** Lecture, 3 hours; discussion, 1 hour. Teaches focused reading of works of literature and construction of compelling written arguments about texts. Explores methods of analyzing literature, framing relevant questions, and writing clear essays. Compares fiction and non-fiction, poetry and prose, narrator and author, and ancient and modern. Also covers basic critical concepts. Emphasizes non-English language traditions. Credit is awarded for only one of CPLT 001 or CPLT 001W.

**CPLT 001W. Introduction to Close Reading (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ENGL 001B with a grade of "C" or better; or consent of instructor. Teaches focused reading of literature and construction of compelling written arguments. Compares fiction and non-fiction, poetry and prose, and narrator and author. Also covers basic critical concepts. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better. Credit is awarded for only one of CPLT 001 or CPLT 001W.

**CPLT 002. Reading World Literature (4)** Lecture, 3 hours; discussion, 1 hour. Teaches concepts of cross-cultural literacy. Explores how writers in different cultures use literature to define the human, process the foreign, and perceive the world. Discusses what world literature has been and what it could be. Considers

reading as a tool for approaching cultural difference. Emphasizes non-English language traditions.

**CPLT 012. The Writer in Writing (4)** Lecture, 3 hours; written work, 2 hours; outside research, 1 hour. Prerequisite(s): none. Targeted at the fledgling creative writer and apprentice literary critic, surveys the complex legacy surrounding the figure of the writer in world literature. Discussion and weekly writing exercises demonstrate the use of brainstorming in creating and critiquing literature. Cross-listed with CRWT 012.

**CPLT 015. Language, Literature, and Culture (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. Introduces students to the connections between language, literature, and culture over the centuries and across national traditions through study of an array of literary forms and genres. Close reading of masterworks, selected to provide an overview of the fields of literary, linguistic, and cultural analysis.

**CPLT 017A. Masterworks of World Literature (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Explores selected great works of literature from around the world in historical and cultural contexts. Covers antiquity to the early Renaissance, emphasizing textual analysis.

**CPLT 017B. Masterworks of World Literature (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Explores selected great works of literature from around the world in historical and cultural contexts. Covers the early Renaissance to the Enlightenment, emphasizing textual analysis.

**CPLT 017C. Masterworks of World Literature (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Explores selected great works of literature from around the world in historical and cultural contexts. Covers the modern period, emphasizing critical methods and approaches to comparative literature.

**CPLT 018. The Nature of Narrative (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. Examines the basic features of narrative (including plot, character, point of view, and time and space relations) within various literary forms, such as the anecdote, story, tale, novella, and novel.

**CPLT 020. Tales of the Supernatural: Literature of the Monstrous and the Uncanny (5)** Lecture, 3 hours; screening, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): none. Explores fiction relating to the supernatural, the uncanny, and the monstrous. Considers a wide variety of texts from diverse national literatures and traditions. Focuses on the interaction of notions of the supernatural with concepts of modernity and technological "progress."

**CPLT 021. Introduction to Film, Literature, and Culture (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Surveys critical approaches to the cinema such as auteur and genre theory. Studies literature and film, national cinemas, and film movements. Cross-listed with MCS 021.

**CPLT 022A. Introduction to World Literature by Women (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to world literature by women across many centuries. Covers the creative work of women from ancient to early modern periods, examining both texts and the historical circumstances of the earliest women writers. Emphasis is on texts originally written in languages other than English, from around the globe. Cross-listed with WMST 022A.

**CPLT 022B. Introduction to World Literature by Women (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the increasingly powerful voices of women writers in modernity and

postmodernity. Emphasis is on texts originally written in languages other than English, from around the globe. Topics include the question of feminine writing and feminist theories about literature by women. Cross-listed with WMST 022B.

**CPLT 023. Modern Japan and Personal Narrative (4)** Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Introduces major debates in history, politics, and culture through the genres of biography, autobiography, diary, and confession. Explores the parallel construction of the modern nation, the modern language, and the modern self. Traces the development of Japan's "I-novel." Builds skills in close reading by studying the rhetoric of self-narrative. Cross-listed with AST 023 and JPN 023.

**CPLT 024. World Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduction to world cinema as a fusion of national and international, culturally specific, and globally universal characteristics. Topics include realism, the role of world wars, Hollywood's global reach, alternative aesthetics of third-world cinemas, cross-fertilization between Europe and Asia, and the function of international film festivals and the international film market. Cross-listed with MCS 024.

**CPLT 025. Introduction to Science Fiction (4)** Lecture, 3 hours; outside research, 3 hours. Considers science fiction as an interface between today's scientific and humanistic disciplines. Utilizes books, films, and works of art to examine the interplay of these disciplines. Explores the perspective of science fiction on such themes as time, space, God, nature, mind, and the future.

**CPLT 026. New European Cinemas: Experiment and Innovation (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to a succession of New Waves in European Cinema: *Neorealism* in Italy, *New Wave* in France, and *New Cinema* in Germany, Russia, and Britain. Study of political engagements and technical innovations. Topics include the concept of the auteur, key manifestos, and attempts to define European cinema in film theory. Cross-listed with EUR 026 and MCS 026.

**CPLT 027. Food in Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Explores the representation of food, cooking, and restaurants in films from different national traditions. Includes gender roles; sensuality and sexuality; social class and the economics of food; excess and lack. Cross-listed with MCS 036.

**CPLT 028. Justice, Law, Violence (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the concepts of justice, law, and violence through literary and philosophical texts. Raises fundamental questions of individual human existence within the social collective. Topics include natural right, freedom of will, sacrifice, revolution, gender, and power.

**CPLT 029. The Arts: Approach, Comparison, and Culture (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introductory course on the arts, their meaning and interrelationship as well as their cultural contexts East and West. Stresses such approaches as: How do you understand a poem? What do you look for in a painting? What do you listen for in music? How do different cultural backgrounds help in appreciating a work of art?

**CPLT 040. Literary Response to Disaster and Repression (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An examination of how literature (e.g., memoir, fiction, and poetry) can be utilized in the recovery from disaster or repression. Analyzes examples from Asia,

Africa, and Europe to address the issues of looking squarely, coming to terms, commemoration, and apology. Cross-listed with HIST 040. Credit is awarded for only one of CPLT 040/HIST 040 or CPLT 040W/HIST 040W.

**CPLT 040W. Literary Response to Disaster and Repression (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ENGL 001B with a grade of "C" or better or consent of instructor. Examines how literature is utilized in the recovery from major disaster or repression. Analyzes examples from Asia, Africa, and Europe that address the issues of looking squarely, coming to terms, commemoration, and apology. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better. Cross-listed with HIST 040W. Credit is awarded for only one of CPLT 040/HIST 040 or CPLT 040W/HIST 040W.

**CPLT 056. Cultures of the Japanese Empire (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the social histories and literatures of the Japanese Empire from the foundation of the Meiji state to the present. Includes the Ainu, Okinawan, Taiwanese, and Korean cultures. Explores the concepts of assimilation, citizenship, national language, nation-state, sovereignty, total war, and translation. Utilizes readings in English. Cross-listed with AST 056 and JPN 056.

**CPLT 062. Introduction to Southeast Asian Literature (4) F, W, S** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to modern and contemporary Southeast Asian literature and culture, with a focus on individual national histories. Explores the relationship between aesthetics, politics, and academic scholarship. Readings are in translation; classes are conducted in English. Cross-listed with AST 062.

**CPLT 063. Reading Southeast Asian Stories (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to the modern short story in Southeast Asia, with a focus on literariness and the act of reading. Readings are in translation; classes are conducted in English. Course is repeatable as content changes to a maximum of 8 units. Cross-listed with AST 063. **Maier**

## Upper-Division Courses

**CPLT 110. Literary Analysis and Criticism (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of different critical approaches to literature, through reading and discussion of literary texts and critical essays on those texts. Reading and discussions cover different genres and traditions as well as different critical approaches.

**CPLT 110A. Vienna: Sensuality and Seduction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Cultural study of Vienna from fin de siècle to the present through literature, film, philosophy, and the visual arts. Topics include sexuality, visual desire, crisis of language, anti-Semitism, and the post-World War II confrontation with the Nazi period. All readings are in English; selected readings in German for German majors and minors. Cross-listed with EUR 110A, GER 110A, and WMST 110.

**CPLT 110B. Berlin Metropolis in Literature, Film, Music, and Art (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the metropolis Berlin as gateway between the East and West. Explores

topography of the city through film, art, music, and literary texts. A study of Berlin's dramatic transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course is conducted in English. Cross-listed with AHS 120, EUR 110B, GER 110B, and MCS 178.

**CPLT 112. Mythology (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religions viewed from a variety of theoretical perspectives. Includes material drawn from epics, religious texts, divine hymns, creation myths, heroic legends, and concepts of the afterlife as reflected in literary and nonliterary sources. Cross-listed with CLA 112 and RLST 117.

**CPLT 114. The Classical Tradition (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the legacy of Greece and Rome in Western culture, from the Renaissance to the present. Topics include literature, art, architecture, and politics. Cross-listed with CLA 114.

**CPLT 115. Modern German History through Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores twentieth-century German history through film. Includes World Wars I and II, inflation and polarization of classes, Nazi Germany, representations of the Holocaust, and a divided and reunited Germany. Cross-listed with GER 163, HISE 163, and MCS 115.

**CPLT 118. The Alien as Other (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers the alien in science fiction studies as an image of both alterity (Otherness) and a reflection on what it means to be human. Topics include alien contact, societies and languages, and the deliberate modifications of both humans and aliens. Utilizes short stories, novels, and film.

**CPLT 120. Autobiography (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the genre of literary autobiography and its visual equivalents (self-portraits and autobiographical film). An examination of narrative structure and point of view; the boundaries between fiction and nonfiction; and concepts such as masks, sexuality, memory, and biculturalism. Focus may change from year to year. Course is repeatable as topics change.

**CPLT 121. Crossing Borders: Immigration, Migration, and Exile in Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Proposes an international look at the phenomenon of migration through film. Film can be considered the foremost medium to do justice to this issue.

**CPLT 123. Transnational Feminist Film and Media (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers contemporary women's and feminist film and media productions. Connects the forces of globalization and militarization with gender-related experiences of displacement, migration, immigration, diaspora, trafficking, and refugee status. Focuses on innovative uses of visual language signaling changes in notions of nation, identity, class, race, ethnicity, gender, and sexuality. Cross-listed with WMST 123.

**CPLT 125. Mutual Fascinations: French-Mexican Cultural Relations (4)** Lecture, 3 hours; term paper, 2 hours; outside research, 1 hour. Prerequisite(s): upper-division standing or consent of instructor.

Explores the mutual attraction between Mexican and French cultures. Readings include the works of Mexicans Reyes, Rivera, Fuentes, and Toledo and Frenchmen Artaud, Breton, Peret, and Soustelle and demonstrate the long-lived attraction between Mexico and France. Examines how artists, writers, and intellectuals are transformed by their experiences in each country.

**CPLT 126. From Novel to Screen: Film Adaptations of German Literature (4)** Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to classic works of German literature and their film adaptations. Explores adaptations by film directors such as Welles, Kubrick, Visconti, and Fassbinder. Studies the nexus between literature, film, and theatre. Course conducted in English. Cross-listed with GER 126 and MCS 126.

**CPLT 131. Marx, Nietzsche, Freud (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical introduction to three central thinkers of modernity. Topics include alienation, free will, revolution, the unconscious, sexual difference, political power, and the modern conception of truth. Readings and discussions are in English. Selected readings are in German for German majors and minors. Cross-listed with GER 131.

**CPLT 132. Rousseau and Revolution (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of the French philosopher and novelist Jean-Jacques Rousseau and the age of revolution in France, Germany, and England. Topics include social inequality, slavery, gender, subjectivity, violence, and political rights. All readings are in English. Cross-listed with FREN 132 and GER 132.

**CPLT 134. Cinematic War Memory (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines cinematic confrontations involving World War II in Germany and Japan. Topics include desire between victims and perpetrators, representation of trauma, and ethical responsibility. All screenings have English subtitles. Cross-listed with GER 134, JPN 134, and MCS 114.

**CPLT 135. Film Noir and Hollywood's German Immigrants (4)** Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the role of German immigrants in the emergence of film noir in 1940s' Hollywood. Examines the revitalization of Weimar Expressionism in Hollywood cinema. Explores traumatic memory, cultural transfer, exile and displacement in films by German filmmaker refugees including Fritz Lang and Billy Wilder. Cross-listed with GER 135 and MCS 170.

**CPLT 136. The Enlightenment and Its Consequences: Modern Europe in the Arts (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the basic ideas of modernity in Europe that are central to the history of western cultures and civilization. Focuses on the function of the arts and sciences in relation to the philosophy and concepts of the Enlightenment. Addresses humankind's changing relationship to religion, state, society, and history, as well as new strategies of self-reflection. Cross-listed with GER 136.

**CPLT 137. Passions, Apparitions, and Automata (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of German Romanticism from its origins in Goethe to its development in

Hoffmann. Topics include madness, sexual desire, doppelgänger, homicide, and *automata*. All readings are in English; selected readings are in German for German majors and minors. Cross-listed with EUR 137 and GER 137.

**CPLT 138. From Expressionism to Epic Theatre: Benn, Brecht, Kafka, and the Bauhaus (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction of the German avant-garde of the twentieth century. Explores expressionism, New Objectivity, the Bauhaus movement, the manifestation of an anti-art in dadaism, and Epic Theatre. Studies works of Franz Kafka in the context of his implicit criticism of the avant-gardist movements of his time. Course is conducted in English. Cross-listed with AHS 121, EUR 138, GER 138, and MCS 182.

**CPLT 140. Italian Renaissance Texts and Contexts (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores changes in notions of space, time, religion, economics, history, politics, art, gender, and sexuality through an interdisciplinary consideration of verbal and visual texts. Readings are of Petrarch, Boccaccio, Veronica Franco, Gaspara Stampa, Machiavelli, Castiglione, Ariosto, Benvenuto Cellini, Marco Polo, Cristoforo Colombo. Presents slides of relevant architecture and visual images. Cross-listed with ITAL 140.

**CPLT 141. Introduction to East-West Comparative Studies (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the basic issues in comparative literature studies of non-Western literatures and cultures. From Renaissance travelogue literature to postmodern mythologies of the Orient, critical and theoretical issues are discussed in the light of the dynamic interactions between the East and the West.

**CPLT 142 (E-Z). Women's Writing in Modern Asia and Asian America (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers comparative histories of feminist literary movements, gender and immigration, autobiography, translation, and subjectivity. Asian literature will be circulated in the original language to students with reading ability (not required). E. Chinese and Chinese American Writing; J. Japanese and Japanese American Writing; K. Korean and Korean American Writing; V. Vietnamese and Vietnamese American Writing. Cross-listed with WMST 142 (E-Z).

**CPLT 143. France and Asia in Literature and the Arts (4)** Lecture, 3 hours; screening, 20 hours per quarter; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores French portrayals of Asia in literature, cinema, the other arts, and popular culture. Topics include colonialism, orientalism, gender, race, and language. Cross-listed with FREN 143.

**CPLT 144. Buddhist Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Readings in canonical and non-canonical Buddhist texts. Includes Buddhist-influenced literature written by Asian, European, and American authors. Examines themes of emptiness, impermanence, and no-self. Cross-listed with AST 133 and RLST 144.

**CPLT 145. Modern Japanese Thought (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of modern Japanese thought from a theoretical and intellectual historical perspective. Topics include philosophical discussions of modernization, "Westernization," nationalism, colonialism and imperi-

alism, "comfort women," Japanese war crimes in continental Asia, the American bombing of Hiroshima and Nagasaki, post-World War II remembrance and denial. All readings are in English. Cross-listed with JPN 145.

**CPLT 146. Comedy and Satire (4)** Lecture, 3 hours; outside reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates the origins and historical development of contemporary Western culture's two most popular genres. Although the focus is on literary texts ranging from Aristophanes to the present, the course also considers the many other cultural media through which the comic and the satiric find expression—among them, caricature drawing, photography, comic books, film, and television. Attention is given to debates about the related functions of irony, laughter, violence, and sexuality.

**CPLT 147 (E-Z). The Novel (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigation of the novel as a preeminent register of cultural values and common literary themes, derived from the various national literatures and literary epochs. The novel form is examined in terms of selected, related works by some of its greatest practitioners. E. The Existential Novel; F. The Carnivalesque. Credit is awarded for only one of CPLT 147F or HNPG 037J.

**CPLT 148. Short Narrative (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis and interpretation of short narrative texts from the linked perspectives of universal themes and shared literary concerns. The finest short prose, including the anecdote, short story, tale, and novella, by some of the world's greatest writers is explored in depth.

**CPLT 149. The Development of Classical Modern Drama (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Consisting of readings, discussions, and lectures, treats plays and theories from the German, Scandinavian, Russian, and French repertoire among others. Covers Naturalism to Expressionism (1880-1918).

**CPLT 151. Palestine/Algeria (4)** Lecture, 3 hours; screening, 6 hours per quarter; extra reading, 24 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Considers two distinct and related literary and historical moments: Palestine and Algeria. Topics include the relations between language and context; literature and literary historiography; genre and idiom; violence and the body; and the state and institutional practices of reading. Cross-listed with ARLC 151 and MEIS 151.

**CPLT 152. Modern Arabic Poetry in a Multilingual Frame (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers selected writings of Adunis ('Ali Ahmed Sa'ïd), Mahmoud Darwish, Abdelatif La'abi, and Etel Adnan, published originally in Arabic, French, and English. Topics include language (idiom, statement, utterance, translation, repetition, rhythm) and history (loss, violence, mourning, inheritance, future, legacy). Course is taught in English. Cross-listed with ARLC 152.

**CPLT 153. Literature, Language, Relation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers the rapport among language, relation, and literature. Focuses upon the relations among context and modes of address (the *Qur'an*, Levinas, Austin, Derrida); the name and the positing force of language (Darwish, Plato, Nietzsche); and language, violence, and poetic statement (Ibn Arabi, Heidegger, Benjamin).

**CPLT 154. Introduction to Arabic Philosophy (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic philosophical texts. Provides close and literary reading of texts in philosophy, as well as considers the impact these texts have had or can have on Western cultural formation. Cross-listed with ARLC 154 and PHIL 128.

**CPLT 155. Introduction to Arabic Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic literature that focuses on language and rhetoric. Considers major issues such as colonialism, secularism, modernity, language, and the state. Utilizes texts from literature, the law, and philosophy. Cross-listed with ARLC 155, MEIS 155, and RLST 157.

**CPLT 156. Jews and Arabs (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with ARLC 156, MEIS 156, and RLST 156.

**CPLT 158. Islam and Psychoanalysis (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores contemporary psychoanalytic readings of Islam to consider the relationship between Islam and Orientalism, Orientalism and psychoanalysis, and psychoanalysis and Islam. Cross-listed with ARLC 158, MEIS 158, and RLST 158.

**CPLT 160 (E-Z). Comparative Cultural Studies: From the Middle Ages to Postmodernism (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Each segment deals with a significant cultural "event" whose implications (historical, political, literary) cross national and cultural boundaries. In order to present a diversity of national and linguistic views, segments are where feasible team taught. F. The French Revolution and Napoleon; G. The Holocaust; M. Millennium and Apocalypse.

**CPLT 163. Nationalism and the Novel (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the novel and its role within nationalism as a representative summary or mirror of the nation. Cross-listed with AST 163.

**CPLT 166. Vietnam and the Philippines (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the comparative national histories of Vietnam and the Philippines by way of great literary works in various genres: poetry, short fiction, and novels. All materials are read in English. Cross-listed with AST 166 and VNM 166.

**CPLT 167. Postcolonial Literature and Criticism in Southeast Asia and South Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how the theoretical concepts of postcolonial criticism inform and challenge the literature of Southeast Asia and South Asia, as the literature itself pushes the limits of the criticism. Addresses themes of nation, identity, space, gender, home, diaspora, alterity, history, sexuality, transnationalism, neocolonialism, tourism, and education. Cross-listed with AST 167.

**WRLT 170. Third World Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division

standing or consent of instructor. Analysis of some major works associated with Third World literature and film. Emphasis on African, Latin American, Caribbean, African-American, and Chicano literature. Cross-listed with ETST 170.

**CPLT 171 (E-Z). Auteurs and Auteur Theory (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical studies on a director or group of directors that deal with a substantial portion of their works. F. Fassbinder; I. Fellini; T. Truffaut. Cross-listed with MCS 121 (E-Z).

**CPLT 173 (E-Z). International Cinemas (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Considers non-Hollywood cinemas in the national, historical, political, and cultural contexts which produced them. E. Experimental and Avant-Garde Film; F. French New Wave; G. New German Cinema; I. Italian Neorealism; T. Third World Cinema; V. Global Perspectives on the Vietnam War. Cross-listed with MCS 173 (E-Z).

**CPLT 174 (E-Z). Comparative Studies in Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers film in the context of the other arts. Compares the treatment of various themes or problems in film and other media. E. Film and Literature in the Avant-Garde. Cross-listed with MCS 174 (E-Z).

**CPLT 178. Religious Biography (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the construction and continuing appropriation of biographical images (textual and visual narratives) in selected religious traditions. Special attention is given to problems of intertextuality and the medium of presentation in the communication of "religious" meaning. Cross-listed with RLST 178.

**CPLT 180 (E-Z). Literature and Related Fields (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical survey of the theories and methodologies involved in the comparative study of literature and nonliterary fields. E. Literature and History; I. Literature and Institutions; L. Prelaw Readings in Literature; M. Literature and Music; P. Literature and Psychopathology; S. Literature and Science; V. Literature and the Visual Arts; X. Literature and Marxism; Z. Literature and Fiction/Fantasy.

**CPLT 181. Existentialism in Literature, Film, and Culture (4)** Lecture, 3 hours; screening, 2 hours; outside research, .5 hours; term paper, .5 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the Existentialist movement in literature, film, and culture. Texts range from essays, plays, and novels to documentary and fiction film. Topics include choice, subjectivity, and alienation. Cross-listed with FREN 181 and MCS 181.

**CPLT 187. Metafiction (4)** Lecture, 3 hours; creative writing, take-home midterm, or term paper, 30 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Covers postmodernism, metafiction, and the new novel in Europe and America. Creative writers submit fiction in lieu of a term paper or midterm. Cross-listed with CRWT 187.

**CPLT 190. Special Studies (1-5)** To be taken with the consent of the chair of the Department as a means of meeting special curricular requirements. Course is repeatable.

**CPLT 193. Capstone Research Seminar (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): Junior standing in Asian Literatures and Cultures,

Classical Studies, Comparative Ancient Civilizations, Comparative Literature, French Studies, Germanic Studies, Languages, or Russian Studies; not open to students who are in their final quarter of study. Develops skills in the formulation and selection of research questions in Comparative Literature. Includes the identification of research questions and the use of primary texts, secondary texts, and theory to seek answers. Addresses techniques in the organization and presentation of writing.

**CPLT 195H. Senior Thesis (1-2)** Open by invitation to students in the Honors Program in Comparative Literature. Grade is deferred until the end of the second or third quarter. To be taken for two or three consecutive quarters; total credit may not exceed 6 units.

**CPLT 196. Senior Research Paper (2)** Consultation, 1 hour; term paper, 3 hours. Prerequisite(s): CPLT 193. A continuation of the research project begun in CPLT 193. Conducted under supervision of a faculty advisor in the applicable field of study. Satisfactory (S) or No Credit (NC) grading is not available.

## Graduate Courses

**CPLT 200. Topics in Southeast Asian Studies (4)** Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the world of Southeast Asia and the scholarly discussions about it, with an emphasis on cultural aspects, embedded in their historical context. Materials are in English. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with SEAS 200.

**CPLT 205. Literature of Southeast Asia (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores themes and theories related to understanding literature and literary culture in Southeast Asia, insisting that the space of literature reaches beyond the text to include all disciplines. Students critically read, engage in, and question discourses of nationhood, identity, loss, mourning, history, and memoir. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with SEAS 205.

**CPLT 210. Canons in Comparative Literature (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies the concept of the canon and literary texts included in it and excluded from it. Considers the distinction between "mainstream" and "marginal" works. Examines how the canon of texts changes over time. Course is repeatable as topics change.

**CPLT 212. Introduction to Graduate Studies in Comparative Literature (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Surveys the history of comparative literature and introduces the beginning graduate student to the various methodologies, aesthetic theories, and critical approaches which have come to dominate its field of inquiry. In addition to class discussion, examinations, and a term paper, students are also involved in a number of practical activities designed to sharpen their critical acumen, enlarge academic vocabulary, and encourage mastery of scholarship procedures.

**CPLT 213. Rhetoric and Argument in Ancient China and Greece (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A study of theories and practices of rhetoric, argument, persuasion, and, in some cases, poetics in ancient China and Greece (texts dating from the fifth to the third centuries B.C.), as well as some of their implications for contemporary theory and prac-

tice. Students who submit a seminar paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. This course may also be taken on a Satisfactory (S) or No Credit (NC) basis by students advanced to candidacy for the Ph.D. Cross-listed with POSC 213.

**CPLT 214. History of Criticism (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; seniors may be admitted by consent of instructor. A survey of critical theories from Plato to modern time through reading and group discussion. Emphasis is on fundamental theoretical issues that recur in the history of literary criticism and are relevant to modern concerns.

**CPLT 215A. Contemporary Critical Theory (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Considers representative critical works and movements in contemporary theory. Includes the study of formalism, structuralism, semiotics, psychoanalytic and feminist theory, and deconstruction.

**CPLT 215B. Issues in Contemporary Theory (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Focuses on a specific problem or movement in contemporary theory. Course is repeatable as content changes.

**CPLT 216. Semiotics: Literature and Culture (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Traces the impact of semiotics through west European, particularly French, structuralist and post-structuralist thought. Considers the very different applications of semiotics in the work of Claude Levi-Strauss, Roland Barthes, Julia Kristeva, Tzvetan Todorov, Jacques Lacan, and Jacques Derrida, among others. Course is repeatable as content changes.

**CPLT 218. Narrative Universals (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Analysis of narrative in concrete literary works. Explores basic considerations and oppositions, including metaphor and metonymy, space and time relations, mimesis and diegesis, monologue and dialogue, literal and figural representation, within the context of specific representative texts.

**CPLT 219. Dante and Italian Cinema (4)** Seminar, 3 hours; screening, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Compares the poetic goals and strategies of each of the three sections of Dante's *Commedia—Inferno, Purgatorio, and Paradiso*—with the innovative cinematic languages of leading post-World War II Italian filmmakers, including Rossellini, Pasolini, Fellini, Antonioni, Cavani, Wertmuller, Nichetti, and Moretti. Integrates theoretical discussions of representation, desire, knowledge, gender, sexuality, and subjectivity with close textual analysis of poetry and film.

**CPLT 220 (E-Z). German Aesthetic Theory (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to individual figures in the history of German aesthetic theory and their legacy in critical discourse. Topics include philhellenism, the beautiful, the sublime, the ugly, fascist chic, mimesis, ornament, the "thing," mechanical reproduction, suddenness, synaesthesia, and technomedia. All readings are in English. E. Kant; F. Benjamin. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Each segment is repeatable as its topics change.

**CPLT 222. Problems in the Pedagogy of Comparative Literature (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Addresses the theories of literary pedagogy and emerging discussions about the teaching of comparative literature.

**CPLT 224. Film Theory (4)** Seminar, 3 hours; screening, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced introduction to classic texts of early and contemporary film theory. Discusses theoretical claims of relevant films. Major concepts include realist film theory, cinema of attractions, apparatus theory, theory of film practice, feminist film theory, and notions of gender, race, and class. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CPLT 243. France and Asia: Orientalism and Beyond (4)** Seminar, 3 hours; screening, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the phenomenon and concept of Orientalism as well as alternative paradigms for East-West aesthetic and cultural relations through theory, literature, and film. Geographical areas and periods of focus may vary. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CPLT 252. Topics in Tourism, Cultural Authenticity, and the Question of Nostalgia (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces theoretical literature concerning the intertwined notions of tourism, cultural authenticity, and nostalgia. Encourages students to approach written texts and other media from a critical perspective, considering the context of both cultural production and consumption. Valuable to students working on issues such as orientalism, modernity studies, diasporic literature, and postcolonial literature. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes.

**CPLT 261. European Modernities (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Examines theoretical issues of late nineteenth-century European modernities. Utilizes literature, art, and popular images from France, England, Austria, and Russia. Addresses aesthetics, consumption, mass culture, fashion, melodrama, technology, psychology, and nihilism. Includes works by Baudelaire, Zola, Braddon, Boucicault, Turgenev, Manet, Degas, Daumier, and Klimt. Course is repeatable as content changes to a maximum of 12 units.

**CPLT 267. Colonialisms and Postcolonial Criticism (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the historical development of post-colonial criticism and how its theoretical concepts inform and challenge the study of literature and culture. Addresses themes of nation, identity, space, gender, home, diaspora, alterity, history, sexuality, transnationalism, neocolonialism, domestic colonialism, tourism, and education. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes.

**CPLT 271. Narratology and Comparative Stylistics (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Considers the development of a modern "rhetoric" of narrative, examining the basic forms or aspects and how they function, both in different narrative contexts (i.e., novel, drama) and in different national and cultural modes.

**CPLT 272. The Origins and Promise of Science Fiction (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies the literary, scientific, and social origins of the science fiction genre and how it generates new themes, narrative structures, and perspectives on the human condition.

**CPLT 273. Genre and Method in Science Fiction Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the critical debate within the field of science fiction and to some of the early and fundamental concepts of what science fiction is and what it does. Examines the development of science fiction from its origins through its influence on critical theory in twentieth- and twenty-first century texts.

**CPLT 274. Representation of Science in Literature (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Examines the interrelations between scientific activity and literary and cultural expression through a study of "scientific" and "literary" narratives. Spans a period of Western culture from Greek science to today's East-West fusion of science and religious cosmology.

**CPLT 275. Science Fiction Authors (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the work of one of the core authors of science fiction and the reception of that work in either the initial formation or later development of the genre. Course is repeatable as content changes to a maximum of 12 units.

**CPLT 276. Science Meets the Fiction (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines how changing scientific views of the world impact the science fiction genre. Studies the evolution of travel narratives and the historical novel into new adaptations of scientific visions of space and time. More broadly, examines how the genre reflects changing social and scientific contexts.

**CPLT 277. Seminar in Comparative Literature (4)** Seminar, 3 hours; consultation, 1 hour. Special topics in comparative literature. Subject may vary from quarter to quarter depending on instructor. Course may be given by visiting faculty. May be repeated.

**CPLT 284. Literature, Colonialism, and Religion (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to debates on secularism and religion in Europe. Examines how these debates may illumine perspectives on literary studies and colonialism.

**CPLT 286. Interdisciplinary Studies (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Examines the idea of academic "disciplines." Studies the relations between literary study and other fields, and how diverse disciplinary methods may be brought to bear on literature taken in the broadest multinational and multilinguistic context. Course is repeatable as content changes.

**CPLT 290. Directed Studies (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CPLT 290 (E-Z). Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair. To be taken as a means of meeting special curricular needs in literature. E. English; F. French; G. German; H. Greek; I. Italian; J. Japanese; K. Chinese; L. Latin; M. Latin American; R. Russian; S. Spanish; T. Scandinavian; U. American; V. Slavic. Segments are repeatable.

**CPLT 291. Individual Studies in Coordinated Areas (1-6)** A directed program of study designed to advise and assist candidates who are preparing for examinations. Open to M.A. and Ph.D. candidates. Does not count toward the unit requirement for the M.A. Graded Satisfactory (S) or No Credit (NC). May be repeated

quarterly until the qualifying examinations are completed.

**CPLT 292. Concurrent Analytical Studies (2)** Research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in CPLT 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the CPLT 100-series course. May be repeated with different topic.

**CPLT 299. Research for Thesis or Dissertation (1-12)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**CPLT 301. Teaching of Foreign Language at the College Level (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

**CPLT 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Comparative Literature. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Related Courses

**CLA 027A, CLA 027B. Classical Literature in Translation. (4, 4)** Descriptions under Classics.

**GER 121 (E-Z). Germanic Literature in Translation. (4)** Description under Languages and Literatures/Germanic Studies.

**ITAL 139. The Divine Comedy. (4)** Description under Italian.

**RLST 120. The Bible, from Egypt to Exile. (4)** Description under Religious Studies.

**RUSN 109A, RUSN 109B, RUSN 109C. Survey of Russian Literature in Translation. (4, 4, 4)** Description under Russian Studies.

## Languages and Literatures/French

**Subject abbreviation: FREN**

### Committee in Charge

Heidi Brevik-Zender, Ph.D., Chair,  
*French/Comparative Literature*

Michelle E. Bloom, Ph.D., *Comparative Literature/French*

Christine Duvergé, Ph.D. *French*

Stephanie B. Hammer, Ph.D. *Comparative Literature/Germanic Studies*

Jennifer Ramos, M.A. *French*

Theda Shapiro, Ph.D., *French/Comparative Literature*

Cheryl Tarantino, M.A. *French/Italian*

Kelle Truby, Ph.D. *French*

Stephen E. Cullenberg, Ph.D.

*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

The department offers the B.A. program in French. The core of the major is the study of French and Francophone literatures and cultures through innovative textual, visual and interdisciplinary approaches.

Students are encouraged to consider opportunities for study through the Education Abroad Program (EAP). This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units towards graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and [placementtest.ucr.edu](http://placementtest.ucr.edu) for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Major

1. CPLT 001 or CPLT 001W, CPLT 002
2. Language proficiency (16 units) - FREN 100, FREN 101A, FREN 101B, FREN 101C
3. Eight courses (32 units) of upper-division electives in the French Program. Of these the student must choose a minimum of five courses (20 units) offered entirely in French. Students may petition to take one course (4 units) outside of the French Program on a related topic. It is strongly encouraged that students take at least one class focusing on a time period earlier than 1800. It is highly recommended that students complete FREN 101B and FREN 101C before enrolling in upper-division electives.
4. CPLT 193 (4 units). (CPLT 196 strongly recommended but not required)

## Minor

1. Language proficiency (16 units) - FREN 100, FREN 101A, FREN 101B, FREN 101C
2. Two courses (8 units) chosen from among upper-division courses offered entirely in French.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Honors Program

Students who wish to undertake a special program of honors study in upper-division courses should apply to the department.

## Graduate Programs

### Master's Degree

The master's program in French is not currently accepting new students.

### Doctoral Degree

Ph.D. studies in French are available through the Ph.D. program in Comparative Literature.

## Lower-Division Courses

**FREN 001. Elementary French (4) F, W, S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): Student must take the French placement examination. An introduction to the sound system and grammar of French. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in French. Audio-lingual and computer-based learning materials available in language laboratory.

**FREN 002. Elementary French (4) F, W, S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): FREN 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of French, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in French. Audio-lingual and computer-based learning materials available in language laboratory.

**FREN 003. Elementary French (4) F, W, S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): FREN 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of French, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in French. Audio-lingual and computer-based learning materials available in language laboratory.

**FREN 004. Intermediate French (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): FREN 003 with a grade of "C-" or better or equivalent. Continued study of the grammatical structures of French; vocabulary building; development of reading and compositional skills. Classes conducted in French.

**FREN 009A. French for Reading Knowledge (4)** Lecture, 3 hours. A specialized course developing the skill to translate from French into English. No previous knowledge of French is required.

**FREN 009B. French for Reading Knowledge (4)** Lecture, 3 hours. Prerequisite(s): FREN 009A. A specialized course developing the skill to translate from French into English. No previous knowledge of French is required.

**FREN 015A. Intermediate Conversation and Composition (4) F, W, S** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 004 or consent of instructor. Development of speaking, understanding, composition, and reading at the intermediate

level. Review of basic grammar with an aim to active oral and written command. Classes conducted in French.

**FREN 015B. Intermediate Conversation and Composition (4) F, W, S** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 015A. Development of speaking, understanding, composition, and reading at the intermediate level. Review of basic grammar with an aim to active oral and written command. Classes conducted in French.

**FREN 045. French Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Covers masterpieces of French cinema. Examines the historical evolution of French cinema as an art form, with emphasis on major themes and directors. Cross-listed with MCS 045.

**FREN 090. Special Studies (1-3)** To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems. Course is repeatable.

## Upper-Division Courses

**FREN 100. Advanced Conversation (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 015B or equivalent. Practice in the development of oral proficiency and fluency of expression. Only 4 units to apply toward the major. Course is repeatable.

**FREN 101A. Advanced Grammar and Stylistics (4) F, W** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 015B or equivalent. Focuses on analytical writing. Writing techniques for introductions, paragraph development, and conclusions are presented and practiced. Students also write essays on literary texts.

**FREN 101B. Advanced Grammar and Stylistics (4) F, W** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 015B or equivalent. An in-depth review of grammar and composition and an introduction to French syntax. At times grammar is presented through a notational approach: how to express cause, goal, consequence, concession, and restriction.

**FREN 101C. Advanced Grammar and Stylistics (4) F, W** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 015B. Promotes awareness of the differences between English and French through translation. Topics include tense use, prepositions, word use, and syntax.

**FREN 109A. Main Currents in French Literature: Middle Ages and Renaissance (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): comprehension of written and spoken French. A study of the principal movements in French literature, based on the reading of representative works in their entirety.

**FREN 109B. Main Currents in French Literature: Seventeenth and Eighteenth Centuries (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): comprehension of written and spoken French. A study of the principal movements in French literature, based on the reading of representative works in their entirety.

**FREN 109C. Main Currents in French Literature: Nineteenth Century (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): comprehension of written and spoken French. A study of the principal movements in French literature, based on the reading of representative works in their entirety.

**FREN 109D. Main Currents in French Literature: Twentieth Century (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): comprehension of written and spoken French. A study of the principal movements in

French literature, based on the reading of representative works in their entirety.

**FREN 112. Mythology in French Literature, Film, and the Visual Arts (4)** Lecture, 3 hours; field, 1 hour; outside research, 1 hour; term paper, 1 hour. Prerequisite(s): FREN 101A or FREN 101B or FREN 101C or consent of instructor. Studies myths and mythological figures in 17th- through 20th-century French texts. Focuses on literature (theatre, short stories, and novels), and film, painting, and popular culture. Myths include Pygmalion, Venus, Orpheus, Narcissus and Echo, and Icarus. Course is conducted in French.

**FREN 124 (E-Z). Gender in French Studies (4)** Lecture, 3 hours; extra reading, 2 hours; screening, 1 hour. Prerequisite(s): FREN 101A or FREN 101B or FREN 101C or consent of instructor. Examines gender issues in French studies, including literature, culture, and visual arts. Topics include depictions of women, writing by male and/or female authors, and women in relation to power. Instruction is in French. G. Gender, Race, and Identity Politics; P. Portrayals of Women in Literature and Film.

**FREN 132. Rousseau and Revolution (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of the French philosopher and novelist Jean-Jacques Rousseau and the age of revolution in France, Germany, and England. Topics include social inequality, slavery, gender, subjectivity, violence, and political rights. All readings are in English. Cross-listed with CPLT 132 and GER 132.

**FREN 143. France and Asia in Literature and the Arts (4)** Lecture, 3 hours; screening, 20 hours per quarter; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores French portrayals of Asia in literature, cinema, the other arts, and popular culture. Topics include colonialism, orientalism, gender, race, and language. Cross-listed with CPLT 143.

**FREN 148 (E-Z). French Literature of the City (4)** Lecture, 3 hours; screening, 1 hour; extra reading, 2 hours. Prerequisite(s): FREN 101A or FREN 101B or FREN 101C or consent of instructor. Explores aspects of French literature dealing with city life. Examines visual and cultural material in conjunction with literary works read and discussed. Instruction and reading is in French. S. The Culture of the Paris Suburbs.

**FREN 150 (E-Z). Francophone Studies (4)** Lecture, 3 hours; screening, 1 hour; term paper, 1 hour; outside research, 1 hour. Prerequisite(s): FREN 101A or consent of instructor. Explores the literature, film, and culture of French-speaking countries and regions outside of metropolitan France. Courses taught in French. E. Autobiographies by West African Women; F. Island Literature; W. Writing by and about Women.

**FREN 152. Food and French Literature (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): FREN 101A or consent of instructor. Explores the role of food in French literature. Discusses descriptions of food and concepts such as reading as consuming; food, desire, and sex; gendering of food; cooking, food preparation, recipes, and menus; and food and social class (poverty and wealth). Taught in French.

**FREN 153. Children in French Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): FREN 101A or consent of instructor. Explores the representation of children in French cinema from its inception to the present. Topics include children in the classroom (teachers' pets and troublemakers); outside of school (juvenile delinquents); social class (the underprivileged and well-

off); gender; coming of age; and parental roles (child neglect, the maternal/paternal). Conducted in French.

**FREN 160. The Fashion of Modernity (4)** Lecture, 3 hours; extra reading, 2 hours; outside research, 1 hour. Prerequisite(s): FREN 101A or FREN 101B or FREN 101C or consent of instructor. Examines nineteenth-century French modernity as expressed through fashion. Utilizes critical and literary texts, fashion magazines, and films. Topics include the department store, cross-dressing, ready-to-wear, and the rise of the designer. Incorporates work by Baudelaire, Zola, Rachilde, Feydeau, and Maupassant. Course taught in French.

**FREN 177 (E-Z). Studies in Nineteenth Century French Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): comprehension of written and spoken French. Study of selected topics in nineteenth-century French literature. N. Nineteenth Century Novel; R. Romanticism; S. Symbolism.

**FREN 181. Existentialism in Literature, Film, and Culture (4)** Lecture, 3 hours; screening, 2 hours; outside research, .5 hours; term paper, .5 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the Existentialist movement in literature, film, and culture. Texts range from essays, plays, and novels to documentary and fiction film. Topics include choice, subjectivity, and alienation. Cross-listed with CPLT 181 and MCS 181.

**FREN 185 (E-Z). Studies in French and Francophone Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Studies in the cinema of France and other Francophone countries. Focus is on specific themes in relation to French-language film. Knowledge of French is not required. F. Literature, Cinema, and Culture of the Francophone World; W. Women Directors. Cross-listed with MCS 183 (E-Z).

**FREN 187. Theatre of the Twentieth Century (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): comprehension of written and spoken French. A study of major representative playwrights of the twentieth century, with emphasis on the traditional and/or avant garde theater.

**FREN 190. Special Studies (1-5)** To be taken with the consent of the department chair as a means of meeting special curricular problems. Course is repeatable.

**FREN 195H. Senior Honor Thesis (1-4)** Consultation, 1 hour; individual study, 3-9 hours. Prerequisite(s): invitation by faculty to pursue honors work in French. Senior standing. Intensive study and research in consultation with a faculty member, leading to a senior thesis. Grades will be deferred until presentation of the thesis during the final quarter. Satisfactory (S) or No Credit (NC) grading is not available. To be taken during two or three consecutive quarters; repeatable to a maximum of 8 units.

## Graduate Courses

**FREN 290. Directed Studies (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**FREN 291. Individual Studies in Coordinated Areas (1-6)** A program of studies designed to advise and assist candidates who are preparing for examinations. Open to M.A. candidates. Does not count toward the unit requirement for the M.A. May be repeated quarterly until the qualifying examinations are completed. Graded Satisfactory (S) or No Credit (NC).

**FREN 292. Concurrent Analytical Studies in French (2)** Outside research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in a French 100-series course. To be taken on an individual basis. Student completes a graduate paper based on

research related to the French 100-series course. Course is repeatable as topics change. FREN 100 and the FREN 101A, FREN 101B, and FREN 101C sequence may not be used for FREN 292.

**FREN 299. Research for Thesis or Dissertation (1-12)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**CPLT 301. Teaching of Foreign Language at the College Level (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

**FREN 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in French. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Languages and Literatures/Germanic Studies

**Subject abbreviation: GRST**

### Committee in Charge

Sabine Doran, Ph.D., Chair, *Comparative Literature/Germanic Studies*  
 Stephanie B. Hammer, Ph.D. *Comparative Literature/Germanic Studies*  
 John M. Kim, Ph.D. *Comparative Literature*  
 Sabine Thuerwaechter, Ph.D. *German/Comparative Literature*  
 Heidi Waltz, Ph.D. *Linguistics/Germanic Studies*  
 Stephen E. Cullenberg, Ph.D.  
 Dean, College of Humanities, Arts, and Social Sciences, *ex officio*

The B.A. in Germanic Studies enables a student to specialize in the German language through the acquisition of language competence, as well as exposure to the study of cultural, literary and filmic practices.

Students are encouraged to consider opportunities for study through the Education Abroad Program (EAP). This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units towards graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

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**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and [placementtest.ucr.edu](http://placementtest.ucr.edu) for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Major

- Lower-division requirements (24 units)
  - Sixteen (16) units: GER 001, GER 002, GER 003, GER 004, or equivalents
  - Eight (8) units: CPLT 001 or CPLT 001W, CPLT 002
- Upper-division requirements (36 units)
  - Twelve (12) units from the following: GER 100, GER 101, GER 103A, GER 103B, GER 108
  - Twenty-four (24) units as follows:
    - Sixteen (16) upper-division units in German literature and film beyond the language proficiency requirement
    - LING 111
    - CPLT 193 (CPLT 196 strongly recommended but not required)

## Minor

- Lower-division requirements (16 units)  
 GER 001, GER 002, GER 003, GER 004, or equivalents
- Upper-division requirements (28 units)
  - Sixteen (16) units from the following: GER 100, GER 101, GER 103A, GER 103B, GER 108
  - Twelve (12) upper-division elective units in German literature, film, or courses related to Germanic Studies, with approval of the student's advisor.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Honors Program

Students who wish to undertake a special program of honors study in the upper division should apply at the beginning of the junior year. Acceptance for honors study is based on students' previous grade records and the recommendations of their instructors. Candidates for honors must demonstrate superior capacity for independent study and during the senior year are required write an individually directed senior thesis.

## Graduate Programs

### Master's Degree

The master's program in Germanic Studies is not currently accepting new students.

## Doctoral Degree

Ph.D. studies in Germanic Studies are available through the Ph.D. program in Comparative Literature.

## Lower-Division Courses

**GER 001. Elementary German (4)** Lecture, 4 hours. Prerequisite(s): none. An introduction to the sound system and grammar of German. Focuses on the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Credit is awarded for only one of the following sequences: GER 001, GER 002, and GER 003; GER 010A and GER 010B.

**GER 001R. German for Reading Knowledge (4)** Lecture, 4 hours. Prerequisite(s): none. First of an intensive two-quarter sequence providing a comprehensive coverage of basic German grammar. Differs from GER 001 by placing exclusive emphasis on developing the skills of reading and translating German. No previous knowledge of German is required.

**GER 002. Elementary German (4)** Lecture, 4 hours. Prerequisite(s): GER 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of German. Focuses on the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Credit is awarded for only one of the following sequences: GER 001, GER 002, and GER 003; GER 010A and GER 010B.

**GER 002R. German for Reading Knowledge (4)** Lecture, 4 hours. Prerequisite(s): GER 001R or equivalent. Provides the second of a two-quarter sequence of a comprehensive coverage of basic German grammar. Emphasizes developing the skills of reading and translating German. No previous knowledge of German required.

**GER 003. Elementary German (4)** Lecture, 4 hours. Prerequisite(s): GER 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of German. Focuses on the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Credit is awarded for only one of the following sequences: GER 001, GER 002, and GER 003; GER 010A and GER 010B.

**GER 004. Intermediate German (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): GER 003 with a grade of "C-" or better or equivalent. Involves a grammar review combined with introductory readings of contemporary authors. Develops active language skills through readings, audiovisual media, and field trips.

**GER 010A. Accelerated German (6)** Lecture, 4 hours; discussion, 2 hours. Prerequisite(s): none. Accelerated study of German. The GER 010A and GER 010B sequence is equivalent to the GER 001, GER 002, and GER 003 sequence including the four basic skills of listening, speaking, reading, and writing. Credit is awarded for only one of the GER 001, GER 002, and GER 003 or GER 010A and GER 010B sequences.

**GER 010B. Accelerated German (6)** Lecture, 4 hours; discussion, 2 hours. Prerequisite(s): GER 010A with a grade of "C-" or better or equivalent. An accelerated study of German that covers the four basic skills of listening, speaking, reading, and writing. Credit is awarded for only one of the following sequences: GER 001, GER 002, and GER 003; GER 010A and GER 010B.

**GER 014. The German Big Ten: German-Speaking Authors That Writers Should Know (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): none. An introduction to ten key authors in German literature. Covers from the Brothers Grimm to contemporary writers such as Elfriede Jelinek and Patrick Susskind. Course conducted in English. Cross-listed with CRWT 014.

**GER 045. Introduction to German Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduction to the history of German cinema from the advent of the studio system to the present. Covers film in Germany, Switzerland, and Austria. Attention is paid to the work of German-speaking filmmakers living in other parts of the world. Instruction is in English; all films have subtitles. Cross-listed with MCS 042.

**GER 090. Special Studies (1-3)** To be taken with the consent of the department chair as a means of meeting special curricular problems. Course is repeatable.

## Upper-Division Courses

**GER 100. Introduction to German Literature (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): GER 004; consent of instructor. Involves reading and analysis of literary texts within a literary-historical framework. Seeks to familiarize the beginning student of literature with the main currents, representatives, and genres of modern German literature. Language of instruction is German. **Ochs**

**GER 101. German Conversation (4)** Lecture, 4 hours. Prerequisite(s): GER 004 or equivalent. Involves development of active control of the language with discussion and oral presentation of assigned topics. Supervised work in German phonetics.

**GER 103A. Advanced Composition and Conversation (4)** Lecture, 4 hours. Prerequisite(s): GER 004 or consent of instructor. Emphasis is on the mastery of the subtleties of the German language, including conversation, reading, listening, and writing. Reinforces oral and written skills through exposure to and analysis of a broad range of texts, essay writing, and oral presentations. **Ochs**

**GER 103B. Advanced Composition and Conversation (4)** Lecture, 4 hours. Prerequisite(s): GER 004 or consent of instructor. Improves oral and written proficiency of the German language. Emphasis is on reading increasingly difficult material, conversational use of German, vocabulary building, and study of idioms. Materials include newspaper articles and television programs that explain the German educational system, the arts, history, and politics.

**GER 108. The Art of Translation (4)** Lecture, 1 hour; discussion, 3 hours. Prerequisite(s): GER 101 or GER 103A or GER 103B or consent of instructor. Examines theories of translation, including recognized examples of good and bad translations. Provides an opportunity to put theory into practice.

**GER 109. Masterworks of German Literature in Translation: Plays, Nineteenth-Century Realism to the 1960s (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing. Provides an introduction to the great contribution of German letters to world literature.

**GER 110A. Vienna: Sensuality and Seduction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Cultural study of Vienna from fin de siècle to the present through literature, film, philosophy, and the visual arts. Topics include sexuality, visual desire, crisis of language, anti-Semitism, and the post-World

War II confrontation with the Nazi period. All readings are in English; selected readings in German for German majors and minors. Cross-listed with CPLT 110A, EUR 110A, and WMST 110.

**GER 110B. Berlin Metropolis in Literature, Film, Music, and Art (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the metropolis Berlin as gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. A study of Berlin's dramatic transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course is conducted in English. Cross-listed with AHS 120, CPLT 110B, EUR 110B, and MCS 178.

**GER 118 (E-Z). Topics in German Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of selected films, directors, and movements in German film. Films are in German with English subtitles. No knowledge of German is required. Cross-listed with MCS 118 (E-Z).

**GER 121 (E-Z). Germanic Literature in Translation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of representative works of significant periods or genres in the history of Germanic literature. Topic varies from quarter to quarter. No knowledge of Germanic languages required. With permission of the advisor, may be taken for credit toward the German major if readings are done in German.

**GER 124. Nordic Mythology, Folklore, and Fairytales (4)** Seminar, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the representation of animals, plants, and other appearances of the natural world such as sunrise and sunset in European creation and destruction mythology, fairytales, and folklore. Cross-listed with EUR 124.

**GER 126. From Novel to Screen: Film Adaptations of German Literature (4)** Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to classic works of German literature and their film adaptations. Explores adaptations by film directors such as Welles, Kubrick, Visconti, and Fassbinder. Studies the nexus between literature, film, and theatre. Course conducted in English. Cross-listed with CPLT 126 and MCS 126.

**GER 131. Marx, Nietzsche, Freud (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical introduction to three central thinkers of modernity. Topics include alienation, free will, revolution, the unconscious, sexual difference, political power, and the modern conception of truth. Readings and discussions are in English. Selected readings are in German for German majors and minors. Cross-listed with CPLT 131.

**GER 132. Rousseau and Revolution (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of the French philosopher and novelist Jean-Jacques Rousseau and the age of revolution in France, Germany, and England. Topics include social inequality, slavery, gender, subjectivity, violence, and political rights. All readings are in English. Cross-listed with CPLT 132 and FREN 132.

**GER 134. Cinematic War Memory (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines cinematic confrontations involving World War II in Germany and Japan. Topics

include desire between victims and perpetrators, representation of trauma, and ethical responsibility. All screenings have English subtitles. Cross-listed with CPLT 134, JPN 134, and MCS 114.

**GER 135. Film Noir and Hollywood's German Immigrants (4)** Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the role of German immigrants in the emergence of film noir in 1940s' Hollywood. Examines the revitalization of Weimar Expressionism in Hollywood cinema. Explores traumatic memory, cultural transfer, exile and displacement in films by German filmmaker refugees including Fritz Lang and Billy Wilder. Cross-listed with CPLT 135 and MCS 170.

**GER 136. The Enlightenment and Its Consequences: Modern Europe in the Arts (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the basic ideas of modernity in Europe that are central to the history of western cultures and civilization. Focuses on the function of the arts and sciences in relation to the philosophy and concepts of the Enlightenment. Addresses humankind's changing relationship to religion, state, society, and history, as well as new strategies of self-reflection. Cross-listed with CPLT 136.

**GER 137. Passions, Apparitions, and Automata (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of German Romanticism from its origins in Goethe to its development in Hoffmann. Topics include madness, sexual desire, doppelgänger, homicide, and *automata*. All readings are in English; selected readings are in German for German majors and minors. Cross-listed with CPLT 137 and EUR 137.

**GER 138. From Expressionism to Epic Theatre: Benn, Brecht, Kafka, and the Bauhaus (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction of the German avant-garde of the twentieth century. Explores expressionism, New Objectivity, the Bauhaus movement, the manifestation of an anti-art in dadaism, and Epic Theatre. Studies works of Franz Kafka in the context of his implicit criticism of the avant-gardist movements of his time. Course is conducted in English. Cross-listed with AHS 121, CPLT 138, EUR 138, and MCS 182.

**GER 163. Modern German History through Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores twentieth-century German history through film. Includes World Wars I and II, inflation and polarization of classes, Nazi Germany, representations of the Holocaust, and a divided and reunited Germany. Cross-listed with CPLT 115, HISE 163, and MCS 115.

**GER 173. The Age of Goethe (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the mature work of Goethe against the dual backdrops of *Klassik* and *Romantik*. Considers works by Schiller, Kleist, Holderlin, the Schlegels, and E.T.A. Hoffmann in analysis of early nineteenth-century literary currents in Germany. **Hammer**

**GER 185. Currents in Modern German Literature (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analysis and interpretation of such major modern writers as Brecht, Mann, and Kafka.

**GER 190. Special Studies (1-5)** Tutorial, 1-4 hours. To be taken with the consent of the department chair as

a means of meeting special curricular problems. Course is repeatable.

**GER 191. Seminar in German Literature (4)** Seminar, 3 hours. Prerequisite(s): upper-division standing. The topic varies from quarter to quarter. Course is repeatable to a maximum of 12 units.

## Graduate Courses

**GER 290. Directed Studies (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GER 291. Individual Studies in Coordinated Areas (1-6)** A program of studies designed to advise and assist candidates who are preparing for examinations. Open to M.A. and Ph.D. candidates. Does not count toward the unit requirement for the M.A. Graded Satisfactory (S) or No Credit (NC). May be repeated quarterly until the qualifying examinations are completed.

**GER 292. Concurrent Analytical Studies (2)** Outside research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in German 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the German 100-series course. Course is repeatable with different topic.

**GER 299. Research for Thesis or Dissertation (1-12)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**CPLT 301. Teaching of Foreign Language at the College Level (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

**GER 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in German. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Italian Studies

**Subject abbreviation: ITAL**

### Committee in Charge

Theda Shapiro, Ph.D., Chair  
Marguerite Waller, Ph.D., Acting Chair  
Erith Jaffe-Berg, *Theater*  
Jeanette Kohl, *Art History*  
Nicoletta Tinozzi-Mehrmand, Ph.D.,  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

Students are encouraged to consider opportunities for study through the Education Abroad Program (EAP). This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units towards graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall

program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Minor

The Italian Studies minor offers students the opportunity to attain an advanced level of proficiency in Italian language while taking a number of discipline-based courses that concentrate on Italian themes. The minor complements liberal arts degrees in many aspects of Western or European studies, including art history, history, philosophy, political science, and religious studies.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog.

Requirements for the minor consist of 24 units, distributed as follows:

1. Twelve (12) units of ITAL 101A and ITAL 101B and ITAL 101C
2. Eight (8) units of upper-division courses in Italian literature, film and/or culture offered by the Department of Comparative Literature and Foreign Languages.
3. Four (4) units of upper-division courses in Italian art history, history, film, theatre, or another related discipline offered by other departments and approved by the student's advisor.

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and [placementtest.ucr.edu](http://placementtest.ucr.edu) for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**ITAL 001. Elementary Italian (4)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour. Prerequisite(s): none. An introduction to the sound system and grammar of Italian, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Italian insofar as possible. Audio-lingual and media-based learning materials available in the Media Library.

**ITAL 002. Elementary Italian (4)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour. Prerequisite(s): ITAL 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Italian, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Italian insofar as possible. Audio-lingual and media-based learning materials available in the Media Library.

**ITAL 003. Elementary Italian (4)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour. Prerequisite(s): ITAL 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Italian, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Italian insofar as possible. Audio-lingual and media-based learning materials available in the Media Library.

**ITAL 004. Intermediate Italian (4)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour. Prerequisite(s): ITAL 003 with a grade of "C-" or better or equivalent. Continued study of the basic grammatical structures of Italian, with emphasis on competency in reading, writing, and speaking. Involves reading varied materials, both literary and journalistic, dealing with contemporary Italy.

**ITAL 042. Italian Americans: Voices and Visions (4)** Lecture, 1.5 hours; discussion, 1.5 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): none. A study of the Italian American experience as seen through major works of Italian and Italian American writers and filmmakers. Covers the 1950s to the present. No knowledge of Italian required. Cross-listed with EUR 042.

**ITAL 043. Italian Cuisine and Literature through the Centuries (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Analysis of the relationship between food and literature in Italian culture through the study of gastronomic and literary texts from the Roman to present times. Films are used to enrich this theme.

**ITAL 044. Mafia and Malavita in Italian Literature and Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of the history of malavita in the Italian peninsula. Explores topics from mischievous transgression to organized crime and Mafia, as presented through the works of renowned Italian writers and directors. No knowledge of Italian required. Cross-listed with EUR 044.

**ITAL 045. Italian Cinema (4)** Lecture, 1.5 hours; discussion, 1.5 hours; screening, 3 hours. Prerequisite(s): none. Covers major works of the Italian cinema from Neo-Realism to the present, with emphasis on their historical evolution and representation of major elements of Italian culture. Knowledge of Italian not required. Cross-listed with MCS 044.

**ITAL 090. Special Studies (1-3)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable.

## Upper-Division Courses

**ITAL 101A. Advanced Italian (4)** Lecture, 3 hours; laboratory, 1 hour; individual study, 3 hours. Prerequisite(s): ITAL 004 with a grade of "C" or better or equivalent. Advanced Italian grammar and conversation. Emphasizes mastery of the subtleties of the language in conversation, reading, and writing.

**ITAL 101B. Advanced Italian (4)** Lecture, 3 hours; laboratory, 1 hour; individual study, 3 hours. Prerequisite(s): ITAL 101A. Advanced Italian grammar and conversation. Emphasis is on mastery of the subtleties of the language in conversation, reading, and writing.

**ITAL 101C. Advanced Italian (4)** Lecture, 3 hours; laboratory, 1 hour; individual study, 2 hours. Prerequisite(s): ITAL 101B or equivalent. Advanced Italian grammar and conversation. Emphasis is on mastery of the subtleties of the language in conversation, reading, and writing.

**ITAL 125 (E-Z). Studies in Italian Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ITAL 101A or consent of instructor. Selected topics in Italian literature. Provides detailed study of subjects and periods relevant to Italian culture. Must have good reading and aural comprehension ability in Italian. S. Italian Literature of the Holocaust.

**ITAL 139. The Divine Comedy (4)** Lecture, 3 hours; consultation, 1 hour. A close reading of Dante's *Divine Comedy*, using a bilingual edition. Attention is paid to conceptual and aesthetic questions. Although the work is read in English, students without previous knowledge of Italian are given some instruction in it to enable them to understand parts of the original.

**ITAL 140. Italian Renaissance Texts and Contexts (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores changes in notions of space, time, religion, economics, history, politics, art, gender, and sexuality through an interdisciplinary consideration of verbal and visual texts. Readings are of Petrarch, Boccaccio, Veronica Franco, Gaspara Stampa, Machiavelli, Castiglione, Ariosto, Benvenuto Cellini, Marco Polo, Cristoforo Colombo. Presents slides of relevant architecture and visual images. Cross-listed with CPLT 140.

**ITAL 150. Italian Theatre (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the development of Italian theatre from the commedia dell'arte to our time. Discusses works by Ruzzante, Machiavelli, Metastasio, Goldoni, Alfieri, Verga, Pirandello, Fo, and Rame and includes videos of plays, melodramas, and operas. No knowledge of Italian is required.

**ITAL 158. Italian Literature in the Period of Unification (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of nineteenth-century Italian literature. Emphasis on the pre-Unification, "Risorgimento", period is through the works of Foscolo, Leopardi, Pellico and Manzoni. No knowledge of Italian is required.

**ITAL 162. Contemporary Italian Women Writers in Translation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of works by contemporary Italian women writers from critical, cultural, and historical perspectives. No knowledge of Italian is required.

**ITAL 185. Modern and Contemporary Italian Literature in Translation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers selected works by authors who exemplify major cultural and literary trends in Italy from the period of unification (1860s) to the present. Readings are supplemented by viewing of films. No knowledge of Italian is required.

**ITAL 190. Special Studies (1-5)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable.

## Graduate Courses

**CPLT 290. Directed Studies (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CPLT 290 (E-Z). Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair. To be taken as a means of meeting special curricular needs in literature. E. English; F. French; G. German; H. Greek; I. Italian; J. Japanese; K. Chinese; L. Latin; M. Latin American; R. Russian; S. Spanish; T. Scandinavian; U. American; V. Slavic. Segments are repeatable.

**ITAL 292. Concurrent Analytical Studies (2)** Outside research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in Italian 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the Italian 100-series course. May be repeated with different topic.

## Professional Courses

**CPLT 301. Teaching of Foreign Language at the College Level (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

**ITAL 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Italian. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Russian Studies

**Subject abbreviation: RUSN**

### Committee in Charge

Thomas F. Scanlon, Ph.D., Chair *Classics/Comparative Ancient Civilizations/Comparative Literature*  
Ekaterina Yudina, Ph.D. *Russian*  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

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## Major

The Russian Studies B.A. has been developed for students who are interested in Russian language and literature, Russian history and civilization.

Individual major programs are dependent upon the students' particular interests. In consultation with the advisor, each student plans a coherent program of courses to meet the requirements for the major. Normally, students' programs are submitted for approval no later than the beginning of their junior year.

1. Lower-division requirement: CPLT 015
2. Upper-division requirements
  - a) Language requirement: 12 units from RUSN 101 (E-Z), RUSN 102 (E-Z), RUSN 120 (E-Z), RUSN 103
  - b) Literature requirement: 12 units from RUSN 109A, RUSN 109B, RUSN 109C
3. Civilization requirements: 12 units from EUR 111A, EUR 111B, EUR 111C

In addition, 24 units are selected from appropriate courses in other programs, including linguistics, comparative literature, Russian history, economics, and political science chosen in consultation with a faculty advisor. Total units: 60.

## Minor

The department offers a 24-unit disciplinary minor in Russian Studies.

The requirements for the minor are as follows:

1. Eight (8) units of RUSN 101 (E-Z), RUSN 102 (E-Z), RUSN 103
2. Sixteen (16) units of Russian Literature and Civilization courses chosen from the following: RUSN 109A, RUSN 109B, RUSN 109C, RUSN 120 (E-Z)  
EUR 111A, EUR 111B, EUR 111C

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and **placementtest.ucr.edu** for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Lower-Division Courses

**RUSN 001. Elementary Russian (4)** Lecture, 4 hours. Prerequisite(s): none. An introduction to the sound system and grammar of Russian, with attention to the development of the four skills of listening, speaking, reading, and writing.

**RUSN 002. Elementary Russian (4)** Lecture, 4 hours. Prerequisite(s): RUSN 001 with a grade of "C-" or better. An introduction to the sound system and grammar of Russian. Focuses on the development of the four skills of listening, speaking, reading, and writing.

**RUSN 003. Elementary Russian (4)** Lecture, 4 hours. Prerequisite(s): RUSN 002 with a grade of "C-" or better. An introduction to the sound system and grammar of Russian. Focuses on the development of the four skills of listening, speaking, reading, and writing.

**RUSN 004. Intermediate Russian (4)** Lecture, 4 hours. Prerequisite(s): RUSN 003 with a grade of "C-" or better. A comprehensive review of the basic grammatical structures of Russian. Includes irregular and idiomatic

forms, vocabulary building, and development of conversation and composition skills.

**RUSN 027. Russian Conversation (1)** Discussion, 1 hour. Prerequisite(s): RUSN 001. Weekly discussion of topics of current interest, intended to develop and maintain basic conversational skills. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit for a total of 6 units.

**RUSN 045. Soviet Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A survey of the Soviet cinema, beginning with the film innovations of the 1920s and continuing with representative films from each of the ensuing periods of Soviet culture. All work done in English. Cross-listed with MCS 043.

**RUSN 090. Special Studies (1-5)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable.

## Upper-Division Courses

**RUSN 101 (E-Z). Advanced Russian (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): RUSN 004 or consent of instructor. Students read texts in literature and expository prose, with attention to usage, style, grammar, and interpretation. Emphasis on developing reading and translating skills for adult-level reading competence. G. Readings from Poetry; J. Readings from Soviet Literature; M. Readings from Drama; N. Readings in History; O. Readings in Social Science; Q. Readings in Newspapers and Popular Literature; R. Readings from Classics of Russian Literature.

**RUSN 102 (E-Z). Advanced Russian: Grammar (2)** Lecture, 2 hours. Prerequisite(s): RUSN 004 or consent of instructor. Each segment will deal with a specific topic in Russian grammar at an advanced level. Texts or materials vary from quarter to quarter. E. Nominal Declensions; F. Syntax I; G. Phonetics; I. Syntax II; J. Syntax III; K. Vocabulary Building; M. Verb Morphology.

**RUSN 103. Advanced Russian Conversation and Composition (2)** Lecture, 2 hours. Prerequisite(s): RUSN 004 or consent of instructor. Conversation and short compositions in Russian. Intended to develop and maintain basic conversational and writing skills. Course is repeatable to a maximum of 8 units.

**RUSN 109A. Survey of Russian Literature in Translation (4) F** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to major literary figures and representative masterpieces of the Golden Age (1830-1880). Any course in the RUSN 109A, RUSN 109B, and RUSN 109C sequence may be taken independently.

**RUSN 109B. Survey of Russian Literature in Translation (4) W** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to major literary figures and representative classics of the late nineteenth century and prerevolutionary twentieth century (1880-1917). Any course in the RUSN 109A, RUSN 109B, and RUSN 109C sequence may be taken independently. **Danow**

**RUSN 109C. Survey of Russian Literature in Translation (4) S** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to major literary figures and representative works of the Soviet period (1917-1991). Any course in the RUSN 109A, RUSN 109B, and RUSN 109C sequence may be taken independently. **Danow**

### RUSN 120 (E-Z). Studies in Russian Literature (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): RUSN 004 or consent of instructor. Analysis and discussion of representative works of Russian literature. Readings are in Russian and vary from quarter to quarter. F. Readings in Twentieth Century; G. Readings in Nineteenth Century.

**RUSN 190. Special Studies (1-5)** To be taken with the consent of the chairman of the department as a means of meeting special curricular problems. Course is repeatable.

**RUSN 195. Senior Thesis (1-4)** Outside research, 3-12 hours. Prerequisite(s): senior standing and consent of instructor. The student works independently with a faculty member doing research and preparing a thesis as a final phase of the student's major.

**RUSN 292. Concurrent Analytical Studies (2)** Outside research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in RUSN 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the RUSN 100-series course. May be repeated with different topic. RUSN 103 may not be used for RUSN 292.

## Graduate Courses

**CPLT 290. Directed Studies (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CPLT 290 (E-Z). Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair. To be taken as a means of meeting special curricular needs in literature. E. English; F. French; G. German; H. Greek; I. Italian; J. Japanese; K. Chinese; L. Latin; M. Latin American; R. Russian; S. Spanish; T. Scandinavian; U. American; V. Slavic. Segments are repeatable.

**RUSN 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Russian. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**CPLT 301. Teaching of Foreign Language at the College Level (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

**RUSN 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Russian. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

# Languages and Literatures/Languages

### Committee in Charge

Thomas F. Scanlon, Ph.D., Chair *Classics/Comparative Ancient Civilizations/Comparative Literature*

Heidi Waltz, Ph.D. *Linguistics/Germanic Studies*

Yenna Wu, Ph.D. *Chinese/Civilizations/Comparative Literature*

Stephen E. Cullenberg, Ph.D.

*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

## Major

The B.A. in Languages enables a student to specialize in two foreign languages through the acquisition of language competencies, as well as exposure to the theoretical basis and structure of language itself (linguistics), and the study of the cultural and literary practices, which the target languages reflect and enact. Students interested in a single language concentration should see individual language program listings in this catalog.

### Two Foreign Languages Option

- CPLT 001 or CPLT 001W, CPLT 002, and LING 020
- Elementary and intermediate courses in languages one and two as required
- Sixty-four (64) upper-division units distributed as follows:
  - Language one — 28 units which must include the following minimums:
    - Sixteen (16) units in language
    - Twelve (12) units in literature and culture
  - Language two — 20 units which must include the following minimums:
    - Twelve (12) units in language
    - Eight (8) units in literature and culture
  - LING 111 — 4 units
  - One other course in Linguistics — 4 units
  - Four (4) units of electives in any of the above-mentioned areas
  - CPLT 193 (4 units). CPLT 196 strongly recommended by not required.)

# Literatures and Languages

Subject abbreviation: LTLG

## Graduate Course

**LTLG 250. Colloquium in Literatures and Languages (1-2)** Seminar, 1 hour. Lectures and discussions by staff, visiting scholars and students on current research topic. Students delivering lectures may take the course for 2 units, students attending lecture and discussions may take the course for 1 unit. May not count towards minimum unit requirement for the degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

## Professional Course

**CPLT 301. Teaching of Foreign Language at the College Level (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

## Linguistics

Subject abbreviation: LING

### Committee in Charge

Tenibac (T.S.) Harvey, *Ph.D., Chair, Anthropology*  
 Adalberto Aguirre (Sociology)  
 Michele Back (Hispanic Studies)  
 Curt Burgess (Psychology)  
 Begoña Echeverría (School of Education)  
 Peter Graham (Philosophy)  
 Larry Rosenblum (Psychology)  
 Thomas Scanlon (Comparative Literature & Foreign Languages)  
 Melanie Sperling (School of Education)  
 Stanley Stewart (English)  
 Heidi Waltz (Comparative Literature & Foreign Languages)  
 Howard Wettstein (Philosophy)  
 Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

Linguistics is the science of language. It seeks to discover the psychological and motor mechanisms of human speech, the similarities and differences among languages, how languages change, and the way in which language is acquired. Because linguistics is largely independent of fields with which the student is likely to be familiar, no special background is required for students entering the major.

Linguistics interacts with a wide variety of fields, such as articulatory phonetics (biology), acoustic phonetics (physics), field methods (anthropology), language and culture (anthropology), sociolinguistics, psycholinguistics, neurolinguistics, logic, the philosophy of language,

and the study of particular languages (including their history). This interaction provides opportunities for students with varied interests and can give new perspectives to those in related disciplines.

## Major

Upon electing the linguistics major, and certainly no later than the middle of the sophomore year, a student should see the Director of the Linguistics Committee for advising.

The director can help students find a suitable advisor to file the necessary forms. In consultation with an advisor, a student plans a coherent program of specific courses to meet the requirements below. The student and the advisor must then submit a copy of the program to the full Committee on Linguistics for approval.

Students interested in the linguistics major should request from the committee director information concerning the many possible course programs. Many of them permit double majors, thus providing strong preparation for further study in two fields.

Students may add variety and depth to their UCR linguistics major by attending a Summer Program in Linguistics (held in various places) or by participating in the Education Abroad Program (EAP). This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units towards graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

Requirements for the major are as follows:

- LING 020
- Twenty-four (24) upper-division units distributed as follows:
  - LING 111, LING 121, LING 131, LING 141
  - ANTH 123
  - PHIL 132 or PSYC 135
- At least 12 additional upper-division units of linguistic electives, to be chosen in consultation with the advisor and with the approval of the Linguistics Program director. (The additional courses may be in linguistics or in related fields. They may relate either to a particular field or specialization or to general linguistics.)
- Foreign language proficiency equivalent to six quarters (24 units) of study, including at least fourth-quarter proficiency in one language. (Students may arrange with the director to satisfy this requirement by examination.)

## Honors Program in Linguistics

- Linguistics requirement: LING 020, LING 111, LING 121, LING 141, LING 190,

LING 191

- Related courses requirement:
  - ANTH 120, ANTH 123
  - ENGL 112
  - CS 008, CS 010, CS 012
  - MATH 144
  - PHIL 008 or PHIL 008H
  - Additional courses as may be required by the Linguistics Committee
- Language Requirement — study in at least two language areas:
  - Primary language: 24 units of foreign language instruction in a single language (this may include any courses taught in that language) plus courses in the structure, phonetics and history of the primary language, if available
  - Secondary language: 16 units of a single language or at least 8 units in each of two languages (none of which may be members of the same subfamily of Indo-European as the primary language) plus at least 8 units in the structure, phonetics, or history of the language(s) chosen for the secondary area

In fulfilling the language requirement, students interested in earning a degree beyond the B.A. should take into account the foreign language requirements of the graduate schools to which they may apply. Students must have at least a 3.00 GPA in courses required for the Honors Program.

## Lower-Division Courses

**LING 020. Language and Linguistics (4)** Lecture, 3 hours. An introduction to modern linguistics. The nature of language; language structure; grammars; the languages of the world; historical and comparative linguistics; interdisciplinary approaches, including anthropological and psycholinguistics. **Megenney, Waltz**

**LING 021. Grammar (4)** Lecture, 3 hours; consultation, 1 hour. Fundamental concepts of grammatical structure: parts of speech, paradigms, word families, agreement and government, the grammar of sentences and longer units of discourse; style.

## Upper-Division Courses

**LING 111. Phonetics (4)** Lecture, 3 hours; laboratory, 1 hour; outside research, 1 hour; extra reading, 1 hour. Prerequisite(s): LING 020. Practice in pronouncing and recognizing sounds from many languages. Covers methods of transcribing and analyzing these sounds.

**LING 121. Syntax (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): LING 020. Survey of various approaches to syntax, including transformational. Syntactic structures of English and other languages are examined. Applications: English, foreign languages, philosophy, mathematics. **Kronenfeld, Waltz**

**LING 131. Morphology (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): LING 020, LING 111 or LING 121. Studies word structure, the lexical component of language, allomorphy, types of morphemes, and inflexional and derivational morphology. Examines various theories of lexical/morphological organization in the brain. Examples are taken from English and other Indo-European languages.

**LING 141. Phonology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): LING 111. Introduction to the study of functional sound units in speech, including phonotactics, morphophonemics. Various theories are examined, including generative. Applications: speech correction, speech analysis, English, foreign languages. **Levin**

**LING 151. Semantics (4)** Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; term paper, 1 hour. Prerequisite(s): LING 121. Introduces the study of meaning and its metalinguistic preliminaries. Explores lexical, sentence, and utterance meaning (including speech acts, text, and discourse). Provides a survey of theories of meaning, such as structural semantics and language as a semiotic system.

**LING 160 (E-Z). Topics in Dynamic and Comparative Linguistics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): LING 111; LING 121 or LING 141. Comparative analyses of language groups such as Spanish and Portuguese, Slavic languages, and Native American languages. E. Historical Linguistics; F. Dialectology; G. Language Change; I. Sociolinguistics.

**LING 167. Structural/Descriptive Linguistics (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): LING 020 or consent of instructor. An overview, from the original sources, of the contribution of major figures and schools in linguistics from Saussure through early Chomsky. Cross-listed with ANTH 167. **Kronenfeld**

**LING 190. Special Studies (1-5)** To be taken with the consent of the chair of the Committee as a means of meeting special curricular problems. Course is repeatable.

**LING 191. Seminar in Linguistics (4)** Seminar, 3 hours; consultation, 1 hour. Selected topics in language and linguistics. Course is repeatable to a maximum of 12 units.

**LING 192. Tutorial Activities (1-2)** Prerequisite(s): junior or senior standing and nomination by faculty. Enlarging understanding of linguistics through conducting tutorial sessions in introductory courses, under the supervision of faculty members responsible for the courses involved. Graded Satisfactory (S) or No Credit (NC). May be repeated for a maximum of three quarters.

**LING 195. Senior Thesis (2-4)** Thesis, 6-12 hours. Prerequisite(s): senior standing or consent of instructor. Independent research and preparation of a thesis completed under the supervision of a faculty member. Course is repeatable to a maximum of 12 units.

**LING 195H. Senior Honors Thesis (2-4)** Thesis, 6-12 hours. Prerequisite(s): invitation by faculty to pursue honors work in Linguistics; senior standing or consent of instructor. Intensive study, research, and preparation of a thesis in consultation with a faculty member. Grades are deferred until presentation of the thesis at the end of the final quarter. Satisfactory (S) or No Credit (NC) grading is not available. To be taken during two or three successive quarters; course is repeatable to a maximum of 12 units.

## Related Courses

Refer to departmental listings for course descriptions.

### Anthropology

- ANTH 120 (Language and Culture)
- ANTH 123 (Linguistic Anthropology)
- ANTH 165 (Cognitive Anthropology)
- ANTH 259 (Anthropological Linguistics)

### Education

- EDUC 172 (Reading and Language Development)
- EDUC 177A (Language Development in Content Areas)

EDUC 177B (Language Development in Content Areas)

EDUC 201A (Theories and Processes of Reading)

### English

ENGL 112 (History of the English Language)

### Languages and Literatures/French

FREN 104 (Phonetics)

### Mathematics

MATH 144 (Introduction to Set Theory)

### Philosophy

PHIL 125 (Intermediate Logic)

PHIL 126 (Advanced Logic)

PHIL 132 (Philosophy of Language)

### Psychology

PSYC 110 (The Brain and Behavior)

PSYC 134 (Cognitive Processes)

PSYC 135 (Psycholinguistics)

PSYC 163 (Cognitive Development)

### Spanish

SPN 105 (Phonology of the Spanish Language)

SPN 106A, SPN 106B (Structure of the Spanish Language)

SPN 207 (History of the Spanish Language)

# Computer Engineering

## The Marlan and Rosemary Bourns College of Engineering

Walid Najjar, Ph.D., Director  
Xiang-Dong "Sheldon" Tan, Ph.D.,  
Associate Director  
Advising Office, A159 Bourns Hall  
(951) 827-ENGR (3647);  
[student.engr.ucr.edu](http://student.engr.ucr.edu)

### Committee in Charge

- Walid Najjar, Ph.D. (Computer Science and Engineering)
- Xiang-Dong "Sheldon" Tan, Ph.D. (Electrical Engineering)
- Frank Vahid, Ph.D. (Computer Science and Engineering)
- Albert Wang, Ph.D. (Electrical Engineering)
- Reza Abbaschian, Ph.D.  
*Dean, The Marlan and Rosemary Bourns College of Engineering, ex officio*

## Major

The Computer Engineering major stresses the study of core computer science and electrical engineering topics. It prepares students for careers in the design of complex systems involving computer hardware, computer software, electronics and electrical signals for communications, networking, desktop computing, and embedded computing.

The major is offered jointly by the departments of Computer Science and Engineering, and Electrical Engineering.

The objective of the Computer Engineering program is to produce graduates who:

- have a mastery of the fundamental areas required for designing and using computers and engineered systems that contain computers
- have an ability to apply principles of engineering, mathematics, science, and statistics to the use, design, and interfacing of computers

- are able to apply modern design methodologies and state-of-the-art tools to design problems common to modern computer engineering practice
- have had extensive, relevant laboratory and hands-on experience to strengthen their understanding of scientific, logical, statistical, and engineering principles
- have a well-rounded and balanced education through required studies in elected areas of the humanities and social sciences
- are adept at both oral and written communication
- possess the high-quality undergraduate education necessary to progress to the M.S. and Ph.D. level or succeed in a career in industry
- understand the social, cultural, ethical, and environmental context of their work

The Computer Engineering B.S. degree at UCR is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700. For more details, visit [www1.cs.ucr.edu](http://www1.cs.ucr.edu).

The Intersegmental General Education Transfer Curriculum (IGETC) does not meet transfer requirements for Engineering.

All undergraduates in the College of Engineering must see an advisor at least annually. Visit [student.engr.ucr.edu](http://student.engr.ucr.edu) for details.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Computer Engineering major uses the following major requirements toward the satisfaction of some of the college's Natural Science and Mathematics breadth requirements.

1. MATH 008B or MATH 009A
2. PHYS 040A, PHYS 040B, PHYS 040C

## Major Requirements

1. Lower-division requirements (68 units):
  - a) ENGR 001G
  - b) CS 010, CS 012 or CS 013, CS 014, CS 061
  - c) CS 011/MATH 011
  - d) EE 001A, EE 01LA, EE 001B
  - e) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 046
  - f) PHYS 040A, PHYS 040B, PHYS 040C
  - g) One course of 4 or more units in Chemistry to be selected in consultation with a faculty advisor.
2. Upper-division requirements (85 units minimum)

- a) CS 100, CS 141, CS 161, CS 161L; one course from CS 153 or CS 160
- b) CS 120A/EE 120A, CS 120B/EE 120B; one course from CS 122A or EE 128
- c) CS 111
- d) EE 100A, EE 100B, EE 110A, EE 110B
- e) ENGR 180W
- f) MATH 113
- g) EE 114 or STAT 155
- h) Five courses (at least 20 units) as technical electives from the following set of Computer Science and Engineering, and Electrical Engineering upper-division courses
- CS 100, CS 122A, CS 122B, CS 130, CS 133, CS 150, CS 152, CS 153, CS 160, CS 162, CS 164, CS 165, CS 166, CS 168, CS 169, CS 170, CS 177, CS 179 (E-Z), CS 180, CS 181, CS 183, CS 193
- EE 105, EE 115, EE 128, EE 132, EE 140, EE 141, EE 144, EE 146, EE 150, EE 151, EE 152, EE 175A, EE 175B

The technical electives selected from h) must include either CS 179 (E-Z) or both EE 175A and EE 175B. The selection of the remaining technical electives must be planned, in consultation with a faculty advisor, to include at least one coherent sequence of two classes from either Computer Science and Engineering or Electrical Engineering. The technical electives must be distinct from those used to satisfy the upper-division requirements specified in items a) and b) above.

Students may petition for exceptions to the above degree requirements. Exceptions to Computer Science course requirements must be approved by the Computer Science and Engineering undergraduate advisor or chair, and exceptions to Electrical Engineering course requirements must be approved by the Electrical Engineering undergraduate advisor or chair. Exceptions to other requirements require the approval of the undergraduate advisors or chairs of both departments.

Visit the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu) for a sample program.

## Computer Science and Engineering

**Subject abbreviation: CS**  
**The Marlan and Rosemary Bourns**  
**College of Engineering**

Laxmi N. Bhuyan, Ph.D., Chair  
 Department Office,  
 351 Engineering Building Unit II

(951) 827-5639; [www1.cs.ucr.edu](http://www1.cs.ucr.edu)

### Distinguished Professor

Laxmi N. Bhuyan, Ph.D.

### Professors

Marek Chrobak, Ph.D.  
 Gianfranco Ciardo, Ph.D.  
 Michalis Faloutsos, Ph.D.  
 Rajiv Gupta, Ph.D.  
 Tao Jiang, Ph.D. *President's Chair*  
 Eamonn Keogh, Ph.D.  
 Srikanth Krishnamurthy, Ph.D.  
 Stefano Lonardi, Ph.D.  
 Mart L. Molle, Ph.D.  
 Walid Najjar, Ph.D.  
 Chinya Ravishankar, Ph.D.  
 Vassilis Tsotras, Ph.D.  
 Frank N. Vahid, Ph.D.  
 Neal Young, Ph.D.

### Professors Emeriti

Yang-Chang Hong, Ph.D.  
 Lawrence L. Larmore, Ph.D.  
 Thomas H. Payne, Ph.D.  
 Teodor C. Przymusiński, Ph.D.

### Associate Professors

Evangelos Christidis, Ph.D.  
 Christian Shelton, Ph.D.  
 Victor Zordan, Ph.D.

### Assistant Professors

Philip Brisk, Ph.D.  
 Harsha Madhyastha, Ph.D.  
 Iulian Neamtii, Ph.D.  
 Tamar Shinar, Ph.D.

\*\*

### Assistant Adjunct Professor

Christine Alvarado, Ph.D.

### Cooperating Faculty

Alexander Balandin, Ph.D. (Electrical Engineering)  
 Matthew J. Barth, Ph.D. (Electrical Engineering)  
 Bir Bhanu, Ph.D. (Electrical Engineering)  
 Ilya Dumer, Ph.D. (Electrical Engineering)  
 Thomas Girke, Ph.D. (Botany and Plant Sciences)  
 Lawrence H. Harper, Ph.D. (Mathematics)  
 Roger Lake, Ph.D. (Electrical Engineering)  
 Michel L. Lapidus, Ph.D. (Mathematics)  
 Anastasios Mourikis, Ph.D., (Electrical Engineering)  
 Erik Rolland, Ph.D. (Accounting and Information Systems)  
 Amit Roy-Chowdhury, Ph.D. (Electrical Engineering)  
 Thomas Stahovich, Ph.D. (Mechanical Engineering)  
 V. Sundararajan, Ph.D. (Mechanical Engineering)  
 Xiang-Dong "Sheldon" Tan, Ph.D. (Electrical Engineering)  
 Zhengyuan "Daniel" Xu, Ph.D. (Electrical Engineering)

## Major

The Department of Computer Science and Engineering offers three majors at the undergraduate level. UCR's offerings of all three majors are unique compared to many schools in the emphasis on theoretical foundations and practical applications.

The **Computer Science** major stresses the study of core and advanced computer science topics. It prepares students for a large variety of careers in computing, including software engineering, networks, databases, graphics, algorithms, security, system analysis, and embedded systems.

The **Computer Engineering** major stresses the study of core computer science and electrical engineering topics. It prepares students for careers in the design of complex systems involving computer hardware, com-

puter software, electronics and electrical signals for communication, networking, desktop computing, and embedded computing. The major is offered jointly by the Departments of Computer Science and Engineering, and Electrical Engineering. See Computer Engineering in this catalog.

The objective of the B.S. degree program in Computer Science is to prepare graduates for professional practice in both the private and public sectors and for life-long learning, including the option for graduate degrees, by providing them with:

- Background: the necessary technical competencies, including knowledge of scientific principles and skill at rigorous analysis and creative design
- Breadth: a broad education that includes knowledge of current issues and trends in society and technology
- Professionalism: professional attitudes and ethics and skills for clear communication and responsible teamwork
- Learning environment: a learning environment that is rigorous, challenging, open, and supportive

The **Business Informatics** major covers the core of computer science and basic business and management topics. It prepares students for careers in design and management of computer and information systems, system and network administration, and e-commerce. It is also useful for careers that apply information technology to support business processes.

The objective of the B.S. degree program in Business Informatics is to prepare graduates for professional practice in both the private and public sectors and for life-long learning, including the option for graduate degrees, by providing them with:

- Background: the necessary technical competencies, including knowledge of scientific principles and skill at rigorous analysis and creative design
- Breadth: a broad education that includes knowledge of current issues and trends in society and technology
- Professionalism: professional attitudes and ethics and skills for clear communication and responsible teamwork
- Learning environment: a learning environment that is rigorous, challenging, open, and supportive

All undergraduates in the College of Engineering must see an advisor at least annually. Visit [student.engr.ucr.edu](http://student.engr.ucr.edu) for details.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The **Computer Science** major uses the following major requirements toward the satisfaction of some of the college's Natural Sciences and Mathematics breadth requirements and one of

the college's English Composition breadth requirements.

1. ENGR 180W
2. MATH 008B or MATH 009A
3. PHYS 040A, PHYS 040B, PHYS 040C

The **Business Informatics** major uses the following major requirements toward the satisfaction of the college's Social Sciences breadth requirements and one of the College's Natural Science and Mathematics breadth requirements.

1. ECON 002, ECON 003
2. MATH 008B or MATH 009A
3. SOC 150

## Major Requirements

### Computer Science Major

1. Lower-division requirements (56 units)
  - a) ENGR 001-I
  - b) CS 010, CS 012 or CS 013, CS 014, CS 061
  - c) CS 011/MATH 011
  - d) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A
  - e) PHYS 040A, PHYS 040B, PHYS 040C
  - f) One course of 4 or more units in an engineering discipline outside the field of computer science to be selected in consultation with a faculty advisor. (Either a lower-division or an upper-division course may be used to satisfy this requirement.)
2. Upper-division requirements (90 units minimum)
  - a) ENGR 101-I
  - b) CS 100, CS 141, CS 150, CS 152, CS 153, CS 161, CS 161L, CS 179 (E-Z)
  - c) CS 120A/EE 120A, CS 120B/EE 120B
  - d) CS 111
  - e) ENGR 180W
  - f) MATH 113
  - g) STAT 155
  - h) Two courses from MATH 046, MATH 120, MATH 126, PHIL 124
  - i) At least 24 units of technical electives to be chosen from an approved list of courses which currently includes CS 100, CS 122A, CS 122B, CS 130, CS 133, CS 134, CS 145, CS 151, CS 160, CS 162, CS 164, CS 165, CS 166, CS 168, CS 169, CS 170, CS 177, CS 179 (E-Z) (4 units maximum), CS 180, CS 181, CS 183, CS 193 (4 units maximum), EE 140, MATH 120, MATH 135A, MATH 135B. The technical electives selected must be distinct from those used to satisfy the requirements specified in 2.a)–h) above.

Visit the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu) for a sample program.

### Business Informatics Major

1. Lower-division requirements (51 units)
  - a) ENGR 001M
  - b) BUS 020
  - c) CS 010, CS 012 or CS 013, CS 014, CS 061
  - d) CS 011/MATH 011
  - e) ECON 002, ECON 003
  - f) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A
2. Upper-division requirements (98 units)
  - a) ENGR 101M
  - b) BUS 101, BUS 103, BUS 104/STAT 104, BUS 106/ECON 134
  - c) CS 100, CS 141, CS 153, CS 164, CS 165, CS 166, CS 180
  - d) CS 111
  - e) ENGR 180W
  - f) MATH 113
  - g) SOC 150
  - h) STAT 155
  - i) Twelve (12) units of upper-division Computer Science technical electives, which must be distinct from the above major requirements. These 12 units may be chosen from those courses listed as upper-division requirements or technical electives for the Computer Science major. At least two courses must be in the Department of Computer Science and Engineering.
  - j) Twenty (20) units of Business Administration technical electives, including at least 8 units of courses listed in the Information Systems concentration within the Business Administration major. These 20 units must be distinct from the above major requirements and may be chosen from any of the available Business Administration courses.

Students may petition for exceptions to the above degree requirements. Exceptions to Computer Science course requirements must be approved by the Computer Science and Engineering undergraduate advisor or chair, and exceptions to the Business Administration course requirements must be approved by the Graduate School of Management dean. Exceptions to other requirements require the approval of both the Department of Computer Science and Engineering and the Graduate School of Management.

Visit the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu) for a sample program.

### Minor in Computer Science

The minor in Computer Science is designed to enhance majors with limited computational theory or practice. As such, students with majors in Computer Engineering, Computer Science, Business Informatics, and Mathematics (Computational Mathematics option) are not

eligible.

Requirements for the minor in Computer Science are:

1. Lower-division courses: CS 010, CS 012 or CS 013, CS 014, CS 061, CS 011/MATH 011, MATH 008B or MATH 009A, MATH 009B, MATH 009C
2. Core courses: CS 100, CS 111
3. Three elective courses, each of four or more units, such that:
  - a) Each is an upper-division requirement or a listed technical elective for the Computer Science major, excluding courses numbered 190-199
  - b) No course may be an upper-division requirement of the student's major
  - c) At least two courses must be in the Department of Computer Science and Engineering
4. All courses for the minor must be taken for a letter grade.

**Note** Students with a minor in Computer Science must obtain approval from the undergraduate advisor in Computer Science and Engineering for a specific program of electives consistent with their career goals.

## Graduate Program

The Department of Computer Science and Engineering offers the M.S. and Ph.D. degrees in Computer Science. General requirements are listed in the Graduate Studies section of this catalog. Specific requirements for each degree are described below.

Students enrolled prior to Fall 2008 can still follow the old Graduate Program.

**Combined B.S. + M.S. Five-Year Program** The college offers a combined B.S. + M.S. program in Computer Science designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, a combined SAT Reasoning score above 1950 (or ACT plus Writing equivalent), complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

**Admission** All applicants must supply GRE General Test scores. The GRE subject test in Computer Science is recommended but not required. Applicants should have at least an undergraduate degree in computer science or a closely related field, but applicants who fail to meet this criterion may sometimes be admitted with deficiencies.

**Prerequisite Material** Competence in the areas defined by the following UCR courses is essential to graduate study in computer science:

## 204 / Programs and Courses

CS 141, CS 150, CS 152, CS 153, CS 161/CS 161L

A student who is deficient in any of these competency areas may be asked to complete the corresponding UCR course with a letter grade of at least B+, or to pass a challenge examination based on that course's final exam with a grade of at least B+. All such remedial work should be completed within the first year of graduate study, and in all cases the deficiency must be corrected before a student can enroll in any graduate course from the same specialty area.

**Core Areas** Students have considerable flexibility in selecting specialty area(s) within the program. However, the following core areas introduce fundamental concepts and tools of general interest to all students.

1. Hardware design principles: CS 203A or CS 220.
2. Theoretical foundations: CS 215 or CS 218.
3. Software and systems: CS 201 or CS 202.

**Major Specialty Areas** The department has active research programs in the following major specialty areas. A list of related graduate courses is provided for each area. Courses that qualify for the M.S. Breadth Requirement are marked with an asterisk (\*).

- A. Algorithms, Bioinformatics, and Theory of Computation: CS 215\*, CS 218\*, CS 234, CS 238
- B. Computer Architecture, Embedded Systems, and CAD: CS 203A\*, CS 203B, CS 213, CS 220\*, CS 223, EE 213
- C. Databases, Data Mining, and Machine Learning: CS 205\*, CS 235\*, CS 229, CS 236\*, CS 272
- D. Operating Systems and Distributed Systems: CS 202\*, CS 253, CS 255\*, CS 237
- E. Computer Networks: CS 204\*, CS 237, CS 239\*, CS 240, CS 257, CS 255\*
- F. Programming Languages, Compilers, and Software Engineering: CS 201\*, CS 206\*, CS 207\*, CS 245\*, CS 246\*
- G. Computer Graphics and Human-Computer Interaction: CS 230\*, CS 231\*, CS 233, ME 230, ME 231

### Master's Degree

The Department of Computer Science and Engineering offers the M.S. degree in Computer Science, after completion of the following degree requirements.

**Satisfactory completion** of CS 287 (Colloquium in Computer Science) each quarter of enrollment for full-time in-residence graduate students.

**Course Requirements** 48 quarter units of graduate or upper-division undergraduate courses are required. Students who have completed similar courses elsewhere may petition for a waiver of a required course or for substitution of an alternative course. For students interested in interdisciplinary research, individual study programs can be approved.

1. **Core Requirement (8 units).** Choose one

course from two of the three Core Areas listed above, with no grade lower than B-.

2. **Breadth Requirement (8 units).** Two approved breadth courses chosen in such a way that together the core and breadth courses cover four different Major Specialty Areas (A to G).

3. **Electives (32 units)**

- a. **Project Option.** A student pursuing the M.S. degree, non-thesis option, may include up to 4 units of Directed Studies (CS 290) towards the elective requirement. Of the remaining 28 units, at least 12 units must be approved graduate lecture courses. The remaining 16 units may include additional approved graduate lecture courses, up to 8 units of graduate seminars in CS 260–269, and up to 12 units of approved undergraduate technical electives.

- b. **Thesis Option.** A student pursuing the M.S. degree, thesis option, may include up to 12 units of graduate research (CS 297 or CS 299) towards the elective unit requirement. Of the remaining 20 units, at least 4 units must be approved graduate lecture courses. The remaining 16 units may include additional approved graduate lecture courses, up to 8 units of graduate seminars in CS 260–269, and up to 8 units of approved undergraduate technical electives.

**Capstone Experience** All students must complete a capstone experience that synthesizes and integrates the knowledge and skills obtained throughout the master's program, according to one of the following options. It is the responsibility of the student to find a faculty member willing to supervise the master's project or thesis, to form the faculty examining committee, and to schedule the oral examination.

- a. **Project Option** Students must complete a research project under the guidance of a faculty member. This project will require a written report and will be presented to a committee of at least two faculty members in an oral examination.

- b. **Thesis Option** Students must submit a master's thesis in accordance with the general requirements of the university. The thesis is original research work, and it should demonstrate the student's ability to study a research area, identify an open problem and make a research contribution. The thesis must be presented to and approved by a committee of at least three faculty members.

The normative time for the completion of a M.S. in Computer Science is 2 years.

### Doctoral Degree

The Department of Computer Science and Engineering offers the Ph.D. degree in Computer Science, after completion of the following degree requirements. It provides a research-oriented education in preparation for a career in research, industry, or academia and exploring both the fundamental aspects of computer science and engineering as well as

their applications.

**Satisfactory completion** of CS 287 (Colloquium in Computer Science) each quarter of enrollment for full-time in-residence graduate students.

**Course Work** The course requirements for the Ph.D. degree ensure that Ph.D. students are exposed to fundamental concepts and tools (core requirement), a deep up-to-date view of their research specialty area (depth requirement), and an advanced, up-to-date view of the same topics outside their area (breadth requirement). Students are expected to complete all of these course requirements in the first two years of the program. These requirements consist of 44 quarter units of approved graduate or upper-division undergraduate courses, satisfying all four of the following course work categories. All of these courses must be taken for a letter grade, and no course can be counted towards more than one category. Students who have completed similar courses elsewhere may petition for a waiver of a required course or for substitution of an alternative course.

Units obtained in CS 270, CS 287, CS 290, CS 297, CS 298, CS 299, CS 301, and CS 302 cannot be counted in any course work category.

1. **Core Requirement (12 units).** Choose three courses from at least two of the three Core Areas described above, with no grade lower than B- and an overall core course GPA of at least 3.2.
2. **Depth Requirement (8 units).** Choose two courses listed above under the same Major Area (A to G). This requirement ensures that Ph.D. students, early on in their careers, acquire some depth of knowledge in a particular research area.
3. **Breadth Requirement (12 units).** Choose three courses from at least two different Major Areas (A to G) outside the student's depth area. No course that is listed in the student's depth area can be used to fulfill the breadth requirement, even if it is cross-listed in another area. Students, with the consent of the major professor, may petition for a non-CSE course to be counted towards the breadth requirement.
4. **Electives (12 units).** The remaining courses can be selected from additional CS graduate lecture courses, up to 8 units of graduate seminars in CS 260–269, and up to 8 units of approved undergraduate technical electives. Students, with the consent of the major professor, may petition for a non-CSE course to be counted as an elective.

**Milestones** The Department has established three milestones to mark progress towards the Ph.D. degree in Computer Science: advancement to candidacy, presentation of the dissertation proposal, and final oral examination. A Ph.D. student must also satisfy all applicable Graduate Division requirements for each milestone.

**Milestone I: Advancement to Candidacy.** A student advances to candidacy after he/she has com-

pleted all of the Ph.D. course requirements described above, and passed the combined written and oral qualifying examinations, as described below. These two exams are intended to verify three components of the student's preparation for Ph.D. research: (1) breadth of comprehension sufficient to enable Computer Science research in areas beyond the topic(s) of the research exam and dissertation; (2) ability to perform critical study, analysis and writing in a focused area; and (3) demonstrated research experience or ability to do research.

**Written Qualifying Examination** The written qualifying examination consists of a written report summarizing the oral presentation to be given at the oral qualifying examination. This report must be written in proper technical English and in the style of a typical Computer Science conference or journal publication, and must be submitted to the Qualifying Committee for approval at least one week prior to the oral qualifying examination.

**Oral Qualifying Examination** The student is expected to demonstrate research aptitude by undertaking a research study on some topic (typically a problem from student's chosen research specialty that may be a promising area in which to conduct the dissertation research), under the guidance of his or her faculty major professor. The research must be presented orally to a Qualifying Committee, which is appointed by the Graduate Division based on nominations from the department. The committee evaluates the merits of the work and the student's aptitude for research. The work must represent significant progress towards original and publishable research. This report must be written in proper technical English and in the style of a typical Computer Science conference or journal publication. The student must complete this requirement in no more than two attempts. The normative time for taking the Oral Qualifying Exam is by the end of the fifth quarter.

**Dissertation Committee** After advancing to candidacy, the student must form a Doctoral Examination Committee chaired by his or her major professor. The committee will consist of at least four senate faculty members with at least three members belonging to the CSE department.

**Milestone II: Dissertation Proposal Examination** After advancement to candidacy, the student prepares a dissertation proposal that describes the dissertation topic, summarizes the relevant background literature, and presents a comprehensive research plan for the doctoral dissertation. The Dissertation Proposal Examination evaluates appropriateness of the research topic and the feasibility of the research plan. It also establishes a realistic timeline for the completion of the Dissertation. The Dissertation Committee administers this exam. The normative time for the Dissertation Proposal Exam is by the end of the third year. The Dissertation Proposal exam must be taken at least six months prior to the Final Doctoral Examination.

**Milestone III: Final Doctoral Examination** The

student is required to write a dissertation in accordance with the Graduate Division requirements and may be required to defend it in a public oral final doctoral examination to the Dissertation Committee. After a satisfactory performance on the final doctoral examination, the Dissertation Committee recommends granting the PhD degree. The student's research and the dissertation must both meet the highest standards of originality and scholarship.

The normative time for the completion of a Ph.D. in Computer Science is five years.

## Lower-Division Courses

### CS 005. Introduction to Computer Programming (4)

Lecture, 3 hours; laboratory, 3 hours. An introduction to computer programming for nonengineering and nonscience majors and for students considering taking CS 010 but needing additional preparation. Topics include the history of computing, basic computer operation, the notion of an algorithm, and programming constructs such as variables, expressions, input/output, branches, loops, functions, parameters, arrays, and strings. Credit is not awarded for CS 005 if it has already been awarded for CS 010.

### CS 006. Effective Use of the World Wide Web (4)

Lecture, 3 hours; laboratory, 3 hours. A detailed, non-technical introduction to the Internet, covering Web tools, e-communities, e-commerce, power searching, and verification of information, privacy, and other legal and societal issues.

### CS 008. Introduction to Computing (4)

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. Includes operating system basics (Windows and Unix), word processing, spreadsheets, databases (e.g., Access), E-mail, the Internet, and the World Wide Web. Designed for students not majoring in computer science, engineering, mathematics, or science. Credit is not awarded for CS 008 if it has already been awarded for CS 010.

### CS 010. Introduction to Computer Science for Science, Mathematics, and Engineering I (4)

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): A UCR Mathematics course (may be taken concurrently) or credit for MATH 009A from the Advanced Placement Examination or the Mathematics Advisory Examination; enrollment priority is given to students in the following majors: BS in Bioengineering, BS in Biological Sciences, BS in Business Informatics, BS in Chemical Engineering, BS in Computer Engineering, BS or Minor in Computer Science, BS or MS in Electrical Engineering, BS in Environmental Engineering, BS in Geophysics, Honors Program in Linguistics, BA or BS in Mathematics, BS in Mathematics for Secondary School Teachers, BA or BS in Physics, BA in Media & Cultural Studies, and/or BA or BS in Statistics. This priority is given in the winter quarter. Covers problem solving through structured programming of algorithms on computers using the C++ object-oriented language. Includes variables, expressions, input/output (I/O), branches, loops, functions, parameters, arrays, strings, file I/O, and classes. Also covers software design, testing, and debugging. Credit is not awarded for CS 010 if it has already been awarded for CS 030.

### CS 011. Introduction to Discrete Structures (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009A or MATH 09HA; CS 010 or MATH 009B or MATH 09HB. Introduction to basic concepts of discrete mathematics with emphasis on applications to computer science. Topics include propositional and predicate calculi, elementary set theory, functions, relations, proof techniques, elements of number theory, enumeration, and discrete probability. Cross-listed with MATH 011.

### CS 012. Introduction to Computer Science for Science, Mathematics, and Engineering II (4)

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 010 with a grade of "C" or better; familiarity with C or C++ language; enrollment priority is given to enrollment priority is given to students in the following majors: BS in Biological Sciences, BS in Business Informatics, BS in Computer Engineering, BS or Minor in Computer Science, Honors Program in Linguistics, BA or BS in Mathematics, and/or BA or BS in Statistics. This priority is given in the spring quarter. Covers structured and object-oriented programming in C++. Emphasizes good programming principles and development of substantial programs. Topics include recursion, pointers, linked lists, abstract data types, and libraries. Also covers software engineering principles. Credit is awarded for only one of CS 012 or CS 013.

### CS 013. Introductory Computer Science for Engineering Majors (4)

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 010 with a grade of "C" or better; familiarity with C or C++ language. Covers structured and object-oriented programming in C++. Emphasizes good programming principles and development of substantial programs. Topics include recursion, pointers, linked lists, abstract data types, and libraries. Covers software engineering principles. Utilizes examples and assignments specific to engineering disciplines, such as numerical data analysis, matrix computations, and dynamic systems. Credit is awarded for only one of CS 012 or CS 013.

### CS 014. Introduction to Data Structures and Algorithms (4)

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 012 with a grade of "C" or better or CS 013 with a grade of "C" or better; proficiency in C++. Topics include basic data structures such as arrays, lists, stacks, and queues. Covers dictionaries (including binary search trees and hashing) and priority queues (heaps). Offers an introductory analysis of algorithms, sorting algorithms, and object-oriented programming including abstract data types, inheritance, and polymorphism. Explores solving complex problems through structured software development.

### CS 021. Introduction to UNIX (4)

Lecture, 3 hours. Prerequisite(s): CS 005 or CS 008 or CS 010. A comprehensive introduction to fundamental UNIX principles, architecture, and applications. Covers command-line utilities, piping, redirection, filters, basic shell scripting, file system architecture and permissions, and tools for software compilation, debugging, and version control. Topics are relevant to and enhance students' work in most lower- and upper-division Computer Science courses.

### CS 030. Introduction to Computational Science and Engineering (4)

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 009C (may be taken concurrently); consent of instructor if credit has been awarded for CS 010. Examines fundamental programming concepts using the Matlab language, including problem decomposition, control structures, elementary data structures, file input/output, graphics, and code libraries. Focuses on applications problems in engineering and science, such as numerical equation solvers; matrix operations; searching and sorting; and data analysis. Emphasizes good programming style and computational efficiency.

**CS 049 (E-Z). Language Laboratory (2)** For hours and prerequisites, see segment descriptions. Hands-on, directed exposure to a specific programming language and associated development tools in a laboratory setting. Focus is on exercises and practical applications Graded Satisfactory (S) or No Credit (NC). Each segment is repeatable as topics change to a maximum of 12 units.

**CS 049E. Introductory C and C++ (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010

or knowledge of programming or consent of instructor. Practical introduction to software development using C and C++ in a laboratory setting. Focus is on syntax, concepts, selections from the standard library, and development tool-chain use. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 0496. Advanced C++ (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010 or knowledge of programming or consent of instructor. Exploration of selected advanced topics in C++ in a laboratory setting. Topics include advanced object-oriented techniques, standard template library, interface design, and advanced idiomatic development practices. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 049-I. C# (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010 or knowledge of programming or consent of instructor. Practical exploration of software development using C# in a laboratory setting. Focus is on syntax, concepts, standard library, and development tool-chain use. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 049J. Introductory Java (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010 or knowledge of programming or consent of instructor. Practical introduction to software development using Java in a laboratory setting. Focus is on syntax, concepts, standard, selections from the standard library, and development tool-chain use. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 049M. Matlab (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010 or knowledge of programming or consent of instructor. Practical exploration of problem solving using Matlab in a laboratory setting. Focus is on syntax, concepts, and development tool-chain use. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 049N. Hardware Description (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010 or knowledge of programming or consent of instructor. Introduces hardware description languages (HDLs) used to design modern digital integrated circuits found in a wide variety of electronic devices. Topics include modeling of circuit structure, register transfers, high-level behavior and testbenches; HDL simulation models; use of synthesis tools; and tradeoffs among HDLs. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 049Q. Perl (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010 or knowledge of programming or consent of instructor. Practical exploration of problem solving and software development using Perl in a laboratory setting. Focus is on syntax, concepts, and idiomatic use. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 049S. Bash (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010 or knowledge of programming or consent of instructor. Practical exploration of problem solving using Bash scripting in a laboratory setting. Focus is on syntax, concepts, and idiomatic use. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 049Y. Python (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 005 or CS 010 or knowledge of programming or consent of instructor.

Practical exploration of problem solving and software development using Python in a laboratory setting. Focus is on syntax, concepts, standard library, and development tool-chain use. Graded Satisfactory (S) or No Credit (NC). Segment is repeatable as topics change to a maximum of 12 units.

**CS 061. Machine Organization and Assembly Language Programming (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 010 with a grade of "C" or better. An introduction to computer organization. Topics include number representation, combinational and sequential logic, computer instructions, memory organization, addressing modes, interrupt, input/output (I/O), assembly language programming, assemblers, and linkers.

**CS 066. Introduction to Three-Dimensional Digital Modeling (4)** Lecture, 3 hours; laboratory, 3 hours; individual study, 2 hours. Covers basic skills necessary to create three-dimensional digital images and models. Emphasizes techniques for polygon and curved-surface modeling and photorealistic image creation through material shading, texturing, and lighting. Introduces basic scripting methods to create complex models and images with Autodesk Maya or equivalent. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Cross-listed with ART 066.

**CS 067. Three-Dimensional Digital Modeling and Animation (4)** Lecture, 3 hours; laboratory, 3 hours; individual study, 2 hours. Prerequisite(s): ART 066/CS 066. Builds advanced skills for three-dimensional modeling. Introduces basic computer animation techniques within framework of existing software. Techniques include rigging skeletons for character models, keyframing, and special effects animation using Autodesk Maya software or equivalent. Teaches proficiency in analogous scripting operations. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 8 units. Cross-listed with ART 067.

## Upper-Division Courses

**CS 100. Software Construction (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 014. Covers the development and construction of software products. Topics include design, coding layout, and style; implementation strategies; quality attributes; prototyping, reuse, and components; debugging, testing, and performance; integration and maintenance; documentation; standards, analysis, and selection of tools and environment; and personal software processes.

**CS 111. Discrete Structures (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010; CS 011/MATH 011; MATH 009C or MATH 09HC. Study of discrete mathematical structures with emphasis on applications to computer science. Topics include asymptotic notation, generating functions, recurrence equations, elements of graph theory, trees, algebraic structures, and number theory.

**CS 120A. Logic Design (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 061 with a grade of "C-" or better. Covers the design of digital systems. Topics include Boolean algebra; combinational and sequential logic design; design and use of arithmetic logic units, carry-lookahead adders, multiplexors, decoders, comparators, multipliers, flip-flops, registers, and simple memories; state-machine design; and basic register-transfer level design. Interdisciplinary laboratories involve use of hardware description lan-

guages, synthesis tools, programmable logic, and significant hardware prototyping. Cross-listed with EE 120A.

**CS 120B. Introduction to Embedded Systems (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 120A/EE 120A. Introduction to hardware and software design of digital computing systems embedded in electronic devices (such as digital cameras or portable video games). Topics include embedded processor programming, custom processor design, standard peripherals, memories, interfacing, and hardware/software tradeoffs. Interdisciplinary laboratory involves use of synthesis tools, programmable logic, and microcontrollers and development of working embedded systems. Cross-listed with EE 120B.

**CS 122A. Intermediate Embedded and Real-Time Systems (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 012 or CS 013; CS 120B/EE 120B. Covers software and hardware design of embedded computing systems. Topics include hardware and software codesign, advanced programming paradigms (including state machines and concurrent processes), real-time programming and operating systems, basic control systems, and modern chip and design technologies. Laboratories involve use of microcontrollers, embedded microprocessors, programmable logic and advanced simulation, and debug environments.

**CS 122B. Advanced Embedded and Real-Time Systems (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 122A. Explores state-of-the-art aspects of building embedded computer systems. Topics include real-time programming, synthesis of coprocessor cores, application-specific processors, hardware and software cosimulation and codesign, low-power design, reconfigurable computing, core-based design, and platform-based methodology.

**CS 130. Computer Graphics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 100, MATH 113 (MATH 113 may be taken concurrently); or consent of instructor. A study of the fundamentals of computer graphics necessary to design and build graphics applications. Examines raster graphics algorithms, including scan-converting graphics primitives, anti-aliasing, and clipping. Also covers geometric transformations, viewing, solid modeling techniques, hidden-surface removal algorithms, color models, illumination, and shading.

**CS 133. Computational Geometry (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 100, CS 111, MATH 113, or equivalents. An introduction to the design of geometry algorithms. Covers the basic computational geometry concepts and techniques used in graphics, robotics, and engineering design. Topics include polygons and polytopes, convex hulls, and voronoi diagrams.

**CS 134. Video Game Creation and Design (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 130. Covers academic, theoretical, and practical aspects of video games by exploring common algorithms, data structures, and software design for different genres. Topics include game interface, character movement, intelligent behaviors, and networked or multiplayer games. Requires in-depth, applied programming and a term project, including the design, implementation, and analysis of a computer game.

**CS 141. Intermediate Data Structures and Algorithms (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 014 with a grade of "C-" or better; CS 111; MATH 009C or MATH 09HC; proficiency in C++. Explores basic algorithm analysis using asymptotic notations, summation and recurrence relations, and algorithms and data structures for discrete structures including trees, strings, and graphs. Also covers general algorithm design techniques including "divide-

and-conquer," the greedy method, and dynamic programming. Integrates knowledge of data structures, algorithms, and programming.

**CS 143. Multimedia Technologies and Programming (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 010. Introduces multimedia technologies and programming techniques, multimedia hardware devices, authoring languages and environments, temporal and nontemporal media (interactivity in text, graphics, audio, video, and animation), applications, and trends. Requires a term project. Cross-listed with EE 143.

**CS 145. Combinatorial Optimization Algorithms (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 141; MATH 113 or MATH 131. The study of efficient algorithm design techniques for combinatorial optimization problems. Topics include shortest paths, minimum spanning trees, network flows, maximum matchings, stable matchings, linear programming, duality, two-person games, algorithmic techniques for integer programming problems, NP-completeness, and approximation algorithms.

**CS 150. The Theory of Automata and Formal Languages (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 014; CS 111; MATH 09C or MATH 09HC. A study of formal languages. Includes regular and context-free languages; computational models for generating these languages such as finite-state automata, pushdown automata, regular expressions, and context-free grammars; mathematical properties of the languages and models; equivalence between the models, and an introduction to Turing machines and decidability.

**CS 151. Introduction to Theory of Computation (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 141, CS 150. The study of fundamental questions about the nature of computing. Topics include Turing machines, computability, reductions, complexity theory, complexity classes P and NP, the P=NP problem, NP-completeness, and other time and space complexity classes.

**CS 152. Compiler Design (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 061, CS 100, CS 111, CS 150. Covers the fundamentals of compiler design. Includes lexical analysis, parsing, semantic analysis, compile-time memory organization, run-time memory organization, code generation, and compiler portability issues.

**CS 153. Design of Operating Systems (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 061, CS 100, CS 111, C++ programming proficiency. Covers the principles and practice of operating system design. Includes concurrency, memory management, file systems, protection, security, command languages, scheduling, and system performance.

**CS 160. Concurrent Programming and Parallel Systems (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 061, CS 100, CS 111. A study of concurrent and parallel systems. Topics include modular structure and design, interprocess communication, synchronization, failures, persistence, and concurrency control. Also covers atomic transactions, recovery, language support, distributed interprocess communication, and implementation mechanisms. Provides preparation for the study of operating systems, databases, and computer networking.

**CS 161. Design and Architecture of Computer Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 120B/EE 120B; concurrent enrollment in CS 161L. A study of the fundamentals of computer design. Topics include the performance evaluation of microprocessors, instruction set design and measurements of use, microprocessor implementation techniques including multicycle

and pipelined implementations, computer arithmetic, memory hierarchy, and input/output (I/O) systems.

**CS 161L. Laboratory in Design and Architecture of Computer Systems (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 120B/EE 120B; concurrent enrollment in CS 161. Students design and simulate a complete computer system, using hardware description language and simulator. Topics include instruction set architecture design, assemblers, datapath and control unit design, arithmetic and logic unit, memory and input/output (I/O) systems, and integration of all parts into a working computer system.

**CS 162. Computer Architecture (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 161 and CS 161L with grades of "C-" or better. The study of advanced processor design. Topics include CPU pipelining, data and control hazards, instruction-level parallelism, branch prediction, and dynamic scheduling of instructions. Also covers Very Long Instruction Word (VLIW) processing, multimedia support, design of network and embedded processors, basic multi-processor design, shared memory and message passing, and network topologies.

**CS 164. Computer Networks (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 100, CS 111, CS 153. Covers the fundamentals of computer networks. Topics include layered network architecture, communication protocols, local area networks, UNIX network programming, verification, network security, and performance studies.

**CS 165. Computer Security (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 141, CS 153. Examines the ways in which information systems are vulnerable to security breaches. Topics include attacks; security labels, lattices, and policies; safeguards and countermeasures; intrusion detection; authorization and encryption techniques; networks; digital signatures, certificates, and passwords; privacy issues, firewalls, and spoofing; Trojan horses and computer viruses; CERT Coordination Center; and electronic commerce.

**CS 166. Database Management Systems (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 100, CS 111. Covers architecture of database management systems; relational, network, and hierarchical models; distributed database concepts; query languages; implementation issues; and privacy and security of the database.

**CS 168. Introduction to Very Large Scale Integration (VLSI) Design (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 120A/EE 120A or consent of instructor. Basic electrical properties of metal-oxide-semiconductor (MOS) circuits. MOS circuit design processes. Basic circuit concepts. Subsystem design and layout. Aspects of system design. Memory, registers, and aspects of systems timing. Very large scale integration design.

**CS 169. Mobile Wireless Networks (4)** Lecture, 3 hours; laboratory, 2 hours; extra reading, 1 hour. Prerequisite(s): CS 164 or consent of instructor. Introduces the fundamentals of wireless and mobile networks. Covers wireless channel models; MAC protocols; and wireless network architectures. Also covers cellular; WLAN and ad hoc networks; and routing in multi-hop wireless networks. Includes wireless security and the impact of wireless links on TCP and other transport layer solutions.

**CS 170. Introduction to Artificial Intelligence (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 100, CS 111. An introduction to fundamental problems underlying the design of intelligent systems. Also covers one of the languages of artificial intelligence, such as Prolog or LISP. Includes brute force and heuristic search, problem solving, knowledge representation, predicate logic and logical inference, frames, semantic nets, natural language processing, and expert systems.

**CS 171. Introduction to Expert Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 170 or equivalent. Introduction to methodology of design and implementation of expert systems. Rule-based and frame-based expert systems. Knowledge acquisition and knowledge engineering. Design of expert system shells. Use of expert system shells to construct knowledge-based systems.

**CS 177. Modeling and Simulation (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 100, CS 111, C++ programming proficiency. Covers validation of random number sequences; concepts in modeling and systems analysis; and conceptual models and their mathematical and computer realizations. Examines simulation modeling techniques, including object-oriented modeling and discrete-event modeling. Emphasizes the use of simulation libraries used with programming languages such as C++.

**CS 179 (E-Z). Project in Computer Science (4)** For hours and prerequisites, see segment descriptions. Under the direction of a faculty member, student teams propose, design, build, test, and document software and/or hardware devices or systems. Emphasizes professional and ethical responsibilities and the need to stay current on technology and its global impact on economics, society, and the environment.

**CS 179E. Compilers (4)** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): CS 141 and CS 152 with grades of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a compiler-related system. Incorporates techniques from previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

**CS 179F. Operating Systems (4)** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): CS 153 with a grade of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. CS 160 is recommended. Covers the planning, design, implementation, testing, and documentation of an operating systems-related system. Incorporates techniques from previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

**CS 179G. Database Systems (4)** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): CS 141 and CS 166 with grades of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a database-related system. Incorporates techniques from previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

**CS 179-I. Networks (4)** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): CS 141 and CS 164 with grades of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a network-related system. Incorporates techniques from previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

**CS 179J. Computer Architecture and Embedded Systems (4)** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): CS 100, CS 111, CS 122A, and CS 161 with grades of "C-" or better or consent of instructor; ENGR 180W; 3 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a computer architecture and embedded systems-related system. Incorporates using techniques presented in

previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

**CS 179K. Software Engineering (4)** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): CS 180; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a software engineering-related system. Incorporates techniques presented in previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

**CS 179M. Artificial Intelligence (4)** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): CS 100, CS 111, and CS 170 with grades of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of an artificial intelligence-related system. Incorporates techniques presented in previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

**CS 179N. Graphics and Electronic Games (4)** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): CS 130 with a grade of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a graphics- or electronic game-related system. Incorporates using techniques presented in previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

**CS 180. Introduction to Software Engineering (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 014, CS 100. A study of software engineering techniques for the development, maintenance, and evolution of large software systems. Topics include requirements and specification; system design and implementation; debugging, testing, and quality assurance; reengineering; project management; software process; tools; and environments.

**CS 181. Principles of Programming Languages (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 061, CS 100, CS 111, CS 150. Covers the principles of programming language design. Includes the study and comparison of several programming languages, their features, and their implementations.

**CS 183. UNIX System Administration (4)** Seminar, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 100. Explores the technical aspects of system administration on a Unix system, including advanced Unix. Includes managing system devices, operating system installation, communications, and networking.

**CS 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

**CS 193. Design Project (1-4)** laboratory, 1-6 hours; scheduled research, 1-3 hours; individual study, 1-3 hours. Prerequisite(s): CS 141; consent of instructor. Individual hardware or software design project to include establishment of objectives and criteria, synthesis, analysis, implementation, testing, and documentation. Course is repeatable to a maximum of 8 units.

**CS 194. Independent Reading (1-4)** Prerequisite(s): consent of instructor. Independent reading in material not covered in course work. Normally taken in senior year. Total credit for CS 194 may not exceed 8 units.

**CS 198-I. Individual Internship in Computer Science (1-4)** Internship, 3-12 hours. Prerequisite(s): upper-division standing; at least 12 units in Computer Science courses. An academic internship to provide the student with career experience as a computer scientist in a governmental, industrial, or research unit under the joint supervision of an off-campus sponsor and a faculty member in Computer Science. Each individual program must have the prior approval of both supervisors and the Department chair. A final written report is required. Course is repeatable to a maximum of 8 units.

## Graduate Courses

**CS 201. Compiler Construction (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 152. Covers theory of parsing and translation. Also addresses compiler construction, including lexical analysis, syntax analysis, code generation, and optimization. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 202. Advanced Operating Systems (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 153. Examines recent developments in operating systems. Also covers multiprogramming, parallel programming, time sharing, scheduling and resource allocation, and selected topics. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 203A. Advanced Computer Architecture (4)** Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 161. Covers contemporary computer systems architecture, including stack computers, parallel computers, pipeline processing, database machines, and multiprocessor architecture. Includes evaluation of computer performance. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 203B. Advanced Computer Architecture (4)** Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 203A with a grade of "B" or better. Covers advanced topics in general-purpose computer architecture including instruction-level parallel architectures, as well as very-long-instruction-word, explicitly parallel instruction computing, and multithreaded architectures. Also covers dataflow machines and vector and single instruction multiple data architectures, including multimedia extensions. Also discusses network processors, multimedia processors, and advanced embedded processors. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 204. Advanced Computer Networks (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): CS 014, CS 164. Covers advanced topics in computer networks, layering, Integrated Services Digital Networks (ISDN), and high-speed networks. Also covers performance models and analysis, distributed systems and databases, and case studies. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 205. Artificial Intelligence (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 170 or equivalent. Examines knowledge representation and automated reasoning and their use in capturing common sense and expert knowledge. Also addresses predicate and nonmonotonic logics; resolution and term rewriting; reasoning under

uncertainty; theorem provers; planning systems; and belief networks. Includes special topics in natural language processing, perception, logic programming, expert systems, and deductive databases. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 206. Testing and Verification Techniques in Software Engineering (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CS 141, CS 150, or equivalents; graduate standing. Introduces techniques to verify that software runtime behavior meets its specifications. Topics include model checking (safety, liveness, temporal logics, and abstraction), static and dynamic analysis (data flow analysis, concept analysis, program slicing, and invariant detection), testing (test generation, prioritization, suite reduction, and regression), and automated debugging (fault location and visualization). May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 207. Advanced Programming Languages (4)** Lecture, 3 hours; outside research, 1.5 hours; written work, 1.5 hours. Prerequisite(s): CS 152, CS 181, or equivalents. Introduces the techniques for analyzing program semantics and correctness. Covers simply-typed lambda calculus, as well as basic and advanced type systems. Presents axiomatic, operational, and denotational semantics. Explores programming-language constructs and tools for specifying, reasoning, and verifying correctness properties. Includes safe memory accesses and safe concurrent programming or security. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CS 213. Parallel Processing Architectures (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 161 or CS 203A. A study of parallel processing. Covers static and dynamic interconnection networks; shared memory multiprocessors; and cache coherence and synchronization. Also examines pre-fetching; memory management; message-passing architectures; workstation clusters; scheduling and mapping algorithms; and load balancing in Web servers. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 215. Theory of Computation (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 150. Covers phrase structure grammars and languages; Turing machines; relation of languages to automata; solvable and unsolvable problems; and theoretical limitations of computers. Also examines algorithmic complexity theory; polynomial reducibility; the classes P and NP; and correctness proofs. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 218. Design and Analysis of Algorithms (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 141. A study of efficient data structures and algorithms for solving problems from a variety of areas such as sorting, searching, selection, linear algebra, graph theory, and computational geometry. Also covers worst-case and average-case analysis using recurrence relations, generating functions, upper and lower bounds, and other methods. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 220. Synthesis of Digital Systems (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 141, CS 161. Covers the synthesis and simulation of digital systems. Topics include synthesis at the system, behavioral, register-transfer, and logic levels; application-specific processors; simulation; and emerging system-on-a-chip design methodologies. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 223. Reconfigurable Computing (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CS 202 or CS 203A; consent of instructor. Covers reconfigurable computing, a novel computational model that is fast becoming part of the mainstream in high-performance computing. Addresses architectures, software tools and compilers, programming models, and applications. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CS 229. Machine Learning (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 141, STAT 160A. A study of supervised machine learning that emphasizes discriminative methods. Covers the areas of regression and classification. Topics include linear methods, instance-based learning, neural networks, kernel machines, and additive models. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 230. Computer Graphics (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 141 or CS 218; MATH 113 or MATH 131; graduate standing or consent of instructor. Covers advanced topics related to graphics and necessary fundamentals. Includes geometry representations; affine and perspective transforms; rendering with global illumination and other light models; shading and texture mapping; rasterization and anti-aliasing techniques; and hierarchical and keyframe animation. Also includes projects and/or in-depth programming assignments. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 231. Computer Animation (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 130 or CS 230. Covers topics in computer animation, including motion capture; inverse kinematics; and dynamic simulation. Also examines deformable systems and other natural phenomena; facial animation; high-level behavior control; creature evolution; and procedural techniques. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 233. Pen-Based Computing (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor; computer programming experience. Introduces computational techniques for pen-based user interfaces. Covers fundamental issues such as ink segmentation, sketch parsing, and shape recognition. Explores the topic of sketch understanding, including reasoning about context and correcting errors. Also addresses issues related to building practical pen-based systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ME 231.

**CS 234. Computational Methods for Biomolecular Data (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 111; CS 141 or CS 218; STAT 155 or STAT 160A. A study of computational and statistical methods aimed at automatically analyzing, clustering, and classifying biomolecular data. Includes combinatorial algorithms for pattern discovery; hidden Markov models for sequence analysis; analysis of expression data; and prediction of the three-dimensional structure of RNA and proteins. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 235. Data Mining Techniques (4)** Lecture, 3 hours; term paper, 1.5 hours; project, 1.5 hours. Prerequisite(s): CS 141, CS 166; CS 170 is recommended. Provides students with a broad background in the design and use of data mining algorithms and tools. Includes clustering, classification, association rules mining, time series clustering, and Web mining. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 236. Database Management Systems (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 141; CS 153 or equivalent; CS 166; or consent of instructor. Covers principles of file systems; architecture of database management systems; data models; and relational databases. Also examines logical and physical design of databases; hardware and software implementation of database systems; and distributed databases (e.g., query processing, concurrences, recovery). May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 237. Advanced Topics in Modeling and Simulation (4)** Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 177. Covers formal computer simulation models, such as Discrete Event Specified Models and differential equation models. Examines current developments in simulation languages. Also addresses integrated model development and its applications to complex, large-scale problems. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 238. Algorithmic Techniques in Computational Biology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 141 or CS 218. A study of fundamental algorithms for solving combinatorial or computational problems in molecular biology and genomics. Includes sequence alignment and multiple alignment; bio-database search; gene and regulatory signal recognition; DNA sequence assembly; physical mapping; and reconstruction of evolutionary trees. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 239. Performance Evaluation of Computer Networks (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 164. Offers models and analytical techniques for evaluating the performance of computer networks. Covers basic and intermediate queuing theory and queuing networks and their application to practical systems. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 240. Network Routing (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 141 or CS 204; CS 164. An in-depth study of routing in computer networks. Examines general principles and specific routing protocols and technologies. Topics include Internet, Asynchronous Transfer Mode (ATM), optical, wireless, and ad hoc networks. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 241. Advanced Topics in Network Measurements and Security (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 164 or equivalent. Introduces measuring and building real network systems. Includes hands-on measurement studies and tools. Covers fundamental mathematical and statistical tools; exposure to implementation studies and techniques; principles of network architectures; and challenges in building testbeds and conducting measurements. Explores measurements and modeling of wireline, ad hoc, sensor, and cellular networks. Course is repeatable as content changes to a maximum of 8 units.

**CS 245. Software Evolution (4)** Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 180 or equivalent; graduate standing. Covers the principles, tools, and techniques for disciplined software evolution. Includes migration strategies, change patterns, software maintenance, legacy system reengineering, reverse engineering for program understanding, middleware, source code analysis, software visualization, and program transformation tools. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 246. Advanced Verification Techniques in Software Engineering (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 111, CS 141, CS 150, or equivalents or consent of instructor. A study of advanced techniques to specify and examine the correctness of complex systems and software. Focuses on concurrent and distributed behavior, formal description languages, temporal logics, model checking and symbolic model checking, partial order reduction, and the use of verification tools. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 253. Distributed Systems (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 153. Integrates the theory and practice of distributed systems with a focus on recent developments in distributed systems. Includes middleware architectures; distributed process management and real-time scheduling; dependability; and group communication protocols. Also covers distributed process management; replication; large-scale peer-to-peer systems; Internet content delivery; and Web caching. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 255. Computer Security (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 153 or CS 164 or CS 165. Discusses the theoretical and practical issues arising in the context of computer systems security and the principles underlying the design of secure computing environments. Topics include cryptography, security models, authentication protocols, network security, intrusion detection, attacks and their countermeasures, and secure systems design. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 257. Wireless Networks and Mobile Computing (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): CS 141; CS 164 or CS 204. Introduces basic and advanced concepts of wireless networks and mobile computing. Covers both wireless cellular and ad hoc networks. Includes protocols for medium access control, resource allocation, and routing, as well as transport layer optimizations for the wireless environment. Also covers standards, Bluetooth, and the IEEE 802.11 for wireless local area networks. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 260. Seminar in Computer Science (4)** Seminar, 4 hours. Prerequisite(s): consent of instructor. Covers current research topics in computer science. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D. Course is repeatable.

**CS 261. Seminar in Artificial Intelligence and the Design of Expert Systems (4)** Seminar, 4 hours. Prerequisite(s): graduate standing or consent of instructor. A review of recent research topics in the fields of artificial intelligence and logic programming. Emphasizes expert systems, automated reasoning, and knowledge representation. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 262. Algorithms and Data Structures (4)** Seminar, 4 hours. Prerequisite(s): CS 215, CS 218; or consent of instructor. Selected topics in theoretical computer science. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D. Course is repeatable.

**CS 263. Seminar in Distributed Systems (4)** Seminar, 4 hours. Prerequisite(s): graduate standing; CS 153 or previous operating systems course. Introduces the fundamental topics in distributed computer systems. Topics include distributed file systems, replicated

data, load management, and distributed shared memory. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 267. Seminar in Databases (4)** Seminar, 4 hours. Prerequisite(s): CS 236 or consent of instructor. Focuses on recent research and development issues in the database area. Includes object-oriented databases, heterogeneous databases, parallel databases, benchmarks, transaction processing, query optimization, and performance evaluation. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 269. Software and Hardware Engineering of Embedded Systems (4)** Seminar, 4 hours. Prerequisite(s): CS 120A/EE 120A; consent of instructor. Presents state-of-the-art software and hardware design techniques for embedded computing systems. Topics include specification models, languages, simulation, partitioning algorithms, estimation methods, model refinement, and design methodology. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 270. Special Topics in Advanced Computer Science (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Involves presentations and discussions by faculty and students that focus on new research in computer science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CS 272. Probabilistic Models for Artificial Intelligence (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CS 141, STAT 160A. Covers methods for representing and reasoning about probability distributions in complex domains. Focuses on graphical models and their extensions such as Bayesian networks, Markov networks, hidden Markov models, and dynamic Bayesian networks. Topics include algorithms for probabilistic inference, learning models from data, and decision making. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**CS 287. Colloquium in Computer Science (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing. Lectures on current research topics in computer science presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CS 290. Directed Studies (1-6)** Seminar, 1-6 hours. Prerequisite(s): consent of instructor. Research and special studies in computer science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CS 297. Directed Research (1-6)** Research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Directed research on selected projects in computer science under the sponsorship of assigned faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 72 units.

**CS 298-I. Individual Internship (1-12)** Written work, 1-12 hours; internship, 2-24 hours. Prerequisite(s): graduate standing; consent of instructor. Individual apprenticeship in computer science. Includes field-work with an approved professional individual or organization, and academic work under the direction of a faculty member. A final written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**CS 299. Research for Thesis or Dissertation (1-12)** Individual study, 3-36 hours. Prerequisite(s): graduate standing and consent of instructor. Research in computer science under the direction of a faculty member. This research is to be included as part of the the-

sis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**CS 301. Teaching Computer Science at the College Level (1)** Seminar, 1 hour. Prerequisite(s): graduate standing. A program of weekly meetings and individual formative evaluation required of new Computer Science Teaching Assistants. Covers instructional methods and classroom/section activities most suitable for teaching Computer Science. Conducted by departmental faculty. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CS 302. Apprentice Teaching (1-4)** Seminar, 1-4 hours. Prerequisite(s): enrollment limited to teaching assistants and associates in Computer Science. Supervised teaching in upper- and lower-division Computer Science courses. Required each quarter of all Computer Science teaching assistants and associates. The course is intended to aid in the learning of effective teaching methods such as the handling of Computer Science discussion sections, preparation and grading of examinations, and student relations. Graded Satisfactory (S) or No Credit (NC).

## Conservation Biology

**Subject abbreviation: BLCN**  
**College of Natural and Agricultural Sciences**

Program Office, 1223 Pierce Hall  
(951) 827-7294; [ccb.ucr.edu](http://ccb.ucr.edu)

The major in Conservation Biology is not currently accepting new students. Students who are interested in this field should see the academic advisors at the CNAS Undergraduate Academic Advising Office, (951) 827-7294.

## Upper-Division Courses

**BLCN 190. Special Studies (1-4)** Individual study, 3-12 hours. Prerequisite(s): consent of instructor and Program Chair. To be taken as a means of meeting special curricular needs. Course content, style, requirements, and grading basis is selected in consultation with the instructor and Program Chair. Course is repeatable to a maximum of 12 units.

**BLCN 197. Research for Undergraduates (1-2)** Outside research, 3-6 hours. Prerequisite(s): sophomore, junior, or senior standing in Conservation Biology; consent of instructor and Program Chair. An introduction to research providing the opportunity, through reading and preliminary laboratory work, to develop a research project suitable for BLCN 199. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

**BLCN 198-I. Individual Internship in Conservation Biology (2-4)** Internship, 6-12 hours; consultation, 1 hour; outside reading, 2-4 hours. Prerequisite(s): upper-division standing in Conservation Biology. An off-campus practical experience in the public or private sector related to conservation biology that is conducted under the joint supervision of an off-campus sponsor and a faculty mentor from the Conservation Biology Program. A written report on the internship is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**BLCN 199. Senior Research (1-4)** Laboratory, 3-12 hours. Prerequisite(s): junior or senior standing in Conservation

Biology; consent of instructor and Program Chair. BLCN 197 is recommended. Research in conservation biology performed under the supervision of a faculty member in the Conservation Biology Program. A written research report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

## Creative Writing

**Subject abbreviation: CRWT**  
**College of Humanities, Arts, and Social Sciences**

Andrew Winer, M.F.A., Chair  
Department Office, ARTS 129  
(951) 827-5424; [creativewriting.ucr.edu](http://creativewriting.ucr.edu)

### Professors

Christopher Abani, Ph.D.  
Christopher Buckley, M.F.A.  
Mike Davis, C.Phil.  
Juan Felipe Herrera, M.F.A.  
Tom Lutz, Ph.D.  
Susan C. Straight, M.F.A.

### Professor of the Graduate Division

Maurya Simon, M.F.A.

### Professors Emeritus

Steve Minot, Ph.D.  
Eliud Martinez, Ph.D.  
D. Chuck Whitney, Ph.D.

### Associate Professors

Reza Aslan, Ph.D.  
Nalo Hopkinson, M.A.  
Michael Jayme, M.F.A.  
Laila Lalami, Ph.D.  
Andrew Winer, M.F.A.

### Assistant Professors

Claire Hoffman, M.A., M.S.J.  
Goldberry Long, M.F.A.

### Cooperating Faculty

Stephanie Hammer, Ph.D.

## Major

The Creative Writing major offers a series of workshop courses in poetry, fiction, playwriting, screenwriting, and nonfiction as well as reading courses in poetry and fiction presented from a writer's point of view. They are taught for the most part by poets, fiction writers, and playwrights.

The writing courses are taught as workshops, so that the subject matter (the students' stories, poems, and plays) is different each time the course is offered.

Incoming freshmen and transfer students can apply for a Chancellor's Performance Award, for up to \$4,500. Contact the department office for more information.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Creative Writing are as follows:

Prerequisite courses: CRWT 056 or equivalent, and ENGL 001A or equivalent.

1. Lower-division requirements (20 units; five courses)

Two Creative Writing survey courses from CRWT 046A, CRWT 046B, or CRWT 046C and

Two Creative Writing introductory courses from CRWT 057A, CRWT 057B, or CRWT 057C

and

One literature survey course from CRWT 012/CPLT 012, CRWT 040, CRWT 041, CRWT 042, CRWT 043, CRWT 044, CRWT 045, CRWT 076, ENGL 014, ENGL 015, ENGL 017, CRWT 097H

## 2. Upper-division requirements (60 units)

### a) Three workshop courses in primary genre:

#### **Creative Nonfiction**

CRWT 130, CRWT 132, CRWT 134

or

#### **Poetry**

CRWT 150, CRWT 160, CRWT 170

or

#### **Fiction**

CRWT 152, CRWT 162, CRWT 172

### b) One workshop in second genre:

CRWT 130, CRWT 132, CRWT 134, CRWT 150, CRWT 152, CRWT 160, CRWT 162\*, CRWT 164A/THEA 164A, CRWT 164B/THEA 164B, CRWT 164C/THEA 164C, CRWT 166A/MCS 166A/THEA 166A, CRWT 166B/MCS 166B/THEA 166B, CRWT 166C/MCS 166C/THEA 166C series, CRWT 170\*, CRWT 172\*

\*These workshops may be repeated; however, only 4 units total can be applied to the major.

### c) One workshop in third genre: CRWT 130, CRWT 132, CRWT 134, CRWT 150, CRWT 152, CRWT 160, CRWT 162\*, CRWT 164A/THEA 164A, CRWT 164B/THEA 164B, CRWT 164C/THEA 164C, CRWT 166A/MCS 166A/THEA 166A, CRWT 166B/MCS 166B/THEA 166B, CRWT 166C/MCS 166C/THEA 166C series, CRWT 170\*, CRWT 172\*

\*These workshops may be repeated; however, only 4 units total can be applied to the major.

### d) Three upper-division courses in Creative Writing: CRWT 136, CRWT 143, CRWT 146 (E-Z), CRWT 151, CRWT 155, CRWT 165, CRWT 171, CRWT 173, CRWT 174, CRWT 175, CRWT 176 (E-Z), CRWT 180, CRWT 182, CRWT 185 (E-Z), CRWT 187/CPLT 187, CRWT 191 (may be taken twice but used only once for major credit), CRWT 198I (may be taken only once, for 4 units)

### e) One upper-division course in Art, Art History, Music, Dance, or Theatre (must be a 4-unit course)

### f) Four (4) units of CRWT 195 or

CRWT 195H (Senior Honors Thesis) or any upper division course with term paper

### g) Four upper-division courses of concentration in another discipline or set of disciplines approved by advisor

## Minor

### 1. Lower-division requirements (9 units)

#### a) One introductory writing workshop: CRWT 056

#### b) One introductory reading course: CRWT 040, CRWT 043, CRWT 046A, CRWT 046B, or CRWT 046C.

#### c. One introductory workshop course: CRWT 057, CRWT 057B, CRWT 057C.

### 2. Upper-division requirements (20 units)

#### a) Four (4) units from

##### (1) CRWT 176 (E-Z)

(2) Any upper-division course in English, Comparative Literature and Foreign Languages, or Theatre (except ENGL 101, ENGL 103; FREN 100, FREN 101A, FREN 101B, FREN 101C; GER 101, GER 103A, GER 103B; RUSN 103; SPN 101A, SPN 101B, SPN 101C, SPN 105, SPN 106A, SPN 106B)

#### b) Sixteen (16) units in one of the following emphases:

##### **Nonfiction Emphasis**

##### (1) CRWT 130, CRWT 132, CRWT 134

(2) Four (4) units from CRWT 150, CRWT 152, CRWT 164A/THEA 164A, CRWT 165, CRWT 166A/MCS 166A/THEA 166A, CRWT 171, CRWT 187/CPLT 187

##### **Poetry Emphasis**

##### (1) CRWT 150, CRWT 160, CRWT 170

(2) Four (4) units from CRWT 130, CRWT 152, CRWT 164A/THEA 164A, CRWT 165, CRWT 166A/MCS 166A/THEA 166A, CRWT 171, CRWT 187/CPLT 187

##### **Fiction Emphasis**

##### (1) CRWT 152, CRWT 162, CRWT 172

(2) Four (4) units from CRWT 130, CRWT 150, CRWT 164A/THEA 164A, CRWT 165, CRWT 166A/MCS 166A/THEA 166A, CRWT 187/CPLT 187

##### **Drama Emphasis**

##### (1) CRWT 164A/THEA 164A, CRWT 164B/THEA 164B, CRWT 164C/THEA 164C

(2) Four (4) units from CRWT 130, CRWT 150, CRWT 152, CRWT 165, CRWT 166A/MCS 166A/THEA 166A, CRWT 166B/MCS 166B/THEA 166B, CRWT 166C/MCS 166C/THEA 166C, CRWT 187/CPLT 187, THEA 121

See Minors under the College of Humanities,

Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors. See also Journalism minor.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses that earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

See Creative Writing and Writing for the Performing Arts in this catalog for more information on the M.F.A. in this area.

## Lower-Division Courses

**CRWT 012. The Writer in Writing (4)** Lecture, 3 hours; written work, 2 hours; outside research, 1 hour. Prerequisite(s): none. Targeted at the fledgling creative writer and apprentice literary critic, surveys the complex legacy surrounding the figure of the writer in world literature. Discussion and weekly writing exercises demonstrate the use of brainstorming in creating and critiquing literature. Cross-listed with CPLT 012.

**CRWT 014. The German Big Ten: German-Speaking Authors That Writers Should Know (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): none. An introduction to ten key authors in German literature. Covers from the Brothers Grimm to contemporary writers such as Elfriede Jelinek and Patrick Susskind. Course conducted in English. Cross-listed with GER 014.

**CRWT 040. Fiction and Film (4)** Lecture, 3 hours; screening, 3 hours; practice writing, 1 hour. Prerequisite(s): none. A study of twentieth-century fiction and film from the writer's point of view. Emphasizes narrative elements and literary techniques found in both forms. Explores how novels are translated into film.

**CRWT 041. Poetry and Fiction: A Reading Course for Writers (4)** Lecture, 3 hours; creative imitation practice, 3 hours. Prerequisite(s): none. Active, analytical reading of contemporary poetry and fiction in order to broaden and deepen students' understanding of the craft of writing. Students analyze and practice poetic and fictional techniques.

**CRWT 042. Poetry and Drama: A Reading Course for Writers (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Examines poetic and dramatic techniques in both poetry and drama, including narrative verse, verse novels, and verse drama. Students compose imitations and may also write analytical essays based on the models studied.

**CRWT 043. Creative Writing and Ancestry (4)** Lecture, 3 hours; outside writing, 3 hours. Prerequisite(s):

none. A study of creative writing that explores personal experience and ancestry. Genres studied may include nonfiction, autobiography, fiction, and visual media. Students are required to write in one or more of these genres.

**CRWT 044. Ghosts, Gods, and Monsters: Children's Literature for Writers (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of children's literature, with emphasis on how the craft of tales and fables contributes to their meaning. Explores techniques the beginning writer can learn from children's literature.

**CRWT 045. The Prose Poem and "Short-Short" Story (4)** Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): none. Explores what distinguishes prose poems from "sudden" or "short-short" fiction. Investigates the use of narrative and figurative language and the tapping of the unconscious mind.

**CRWT 046A. Craft of Writing: Survey in Contemporary Fiction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of selected works of contemporary fiction and related texts, with emphasis on the craft of fiction and how craft contributes to meaning. Course is repeatable as content changes to a maximum of 8 units.

**CRWT 046B. Craft of Writing: Survey in Contemporary Poetry (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of selected works of contemporary poetry and related texts, with emphasis on the craft of poetry and how craft contributes to meaning. Course is repeatable as content changes to a maximum of 8 units.

**CRWT 046C. Craft of Writing: Survey in Contemporary Nonfiction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of selected works of contemporary nonfiction and related texts, with emphasis on the craft of nonfiction and how craft contributes to meaning. Course is repeatable as content changes to a maximum of 8 units.

**CRWT 056. Introduction to Creative Writing (4)** Lecture, 3 hours; discussion, 1 hour. An introduction to the craft of creative writing. Focuses on the elements of a number of genres, including poetry, fiction, nonfiction, journalism, drama, and the graphic novel.

**CRWT 057A. Introduction to Fiction (4)** Workshop, 3 hours; written work, 3 hours. Prerequisite(s): CRWT 056, ENGL 001A. Introduction to the elements and the craft of fiction.

**CRWT 057B. Introduction to Poetry (4)** Workshop, 3 hours; written work, 3 hours. Prerequisite(s): CRWT 056, ENGL 001A. Introduction to the elements and craft of poetry.

**CRWT 057C. Introduction to Creative Nonfiction (4)** Workshop, 3 hours; written work, 3 hours. Prerequisite(s): CRWT 056, ENGL 001A. Introduction to the elements and craft of nonfiction.

**CRWT 066. Screenwriting: How Movies Work (4)** Lecture, 3 hours; discussion, 1 hour; screening, 2 hours. Prerequisite(s): none. An introduction to the craft of screenwriting. Discusses how screenwriting differs from other styles of writing. Examines the various techniques that writers use to create their "blueprints" for movies in a variety of genres. Cross-listed with MCS 066 and THEA 066.

**CRWT 076. The Verbal Coliseum: Spoken Word Workshop (5)** Workshop, 3 hours; discussion, 1 hour; written work, 1 hour; extra reading, 2 hours. Explores forms and issues in contemporary spoken word poetics, including performance and writing, multimedia and audience, community relations, media culture and power, music and art, and cultural production. Course is repeatable to a maximum of 8 units.

**CRWT 097H. Freshman Honors Project: Poetry, Fiction, or Nonfiction (4)** Seminar, 3 hours; individual study, 1 hour; extra reading, 1 hour; creative projects, 2 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. An introduction to poetry, fiction, or nonfiction. Utilizes reading, commentary, and criticism in one of these three genres. Fosters exploration of the diversity of literary styles. Promotes awareness of the aesthetic, cultural, and personal resonances of artistic choices. Satisfactory (S) or No Credit (NC) grading is not available.

## Upper-Division Courses

**CRWT 130. Beginning Creative Nonfiction (4)** Workshop, 3 hours; extra reading, 3 hours. Prerequisite(s): two of the following courses: CRWT 057A, CRWT 057B, CRWT 057C. Introduction to creative nonfiction. Covers its history and strategies for writing and critically evaluating creative nonfiction essays. Focuses on writing creative nonfiction essays based on personal experience. Includes readings in current nonfiction. Course is repeatable to a maximum of 8 units.

**CRWT 132. Intermediate Creative Nonfiction (4)** Workshop, 3 hours; written work, 3 hours. Prerequisite(s): CRWT 056, CRWT 130; or consent of instructor. Reviews the essential strategies for writing and critically evaluating creative nonfiction essays. Focuses primarily on memoir, personal experience, and nature and science writing. Course is repeatable to a maximum of 8 units.

**CRWT 134. Advanced Creative Nonfiction (4)** Workshop, 3 hours; written work, 3 hours. Prerequisite(s): CRWT 056, CRWT 130, CRWT 132; or consent of instructor. Explores strategies for writing and critical evaluating creative nonfiction essays. Focuses primarily on memoir, autobiography, history, and interview writing and how to work toward a sequence of longer work of nonfiction in that mode, as well as the "fact" or "immersion" essay. Course is repeatable to a maximum of 8 units.

**CRWT 136. Professional Creative Nonfiction Workshop (5)** Workshop, 3 hours; outside research, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 056, CRWT 130, CRWT 132, CRWT 134; or consent of instructor. A workshop in creative nonfiction writing for students who want to study creative nonfiction at the graduate and professional level. Focuses on producing and polishing work and discusses the professional aspect of writing, such as submitting and publishing.

**CRWT 143. Generational Texts: A Survey of Immigration and Identity in Contemporary Literature (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 043. Examines the influence of dominant cultures on twentieth-century literature. Topics include the experience of immigration and the notion of legitimacy and ethnic identity. Covers writers such as Ralph Ellison, Sherman Alexie, Jhumpa Lahiri, and Upton Sinclair. Course is repeatable as content changes to a maximum of 8 units.

**CRWT 146 (E-Z). Special Topics: Fiction (4)** Seminar, 3 hours; workshop, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 056 or consent of instructor. Explores specific topics of style and craft in fiction. E. Minimalism: Hemingway to Carver and Beyond; F. Magical Realism and Surrealism, Past and Present; G. Genre Fiction and Styles: Potential for Legitimacy.

**CRWT 150. Beginning Poetry Workshop (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): two of the following courses: CRWT 057A, CRWT 057B, CRWT 057C. Students write poetry which is analyzed by the class. Requires substantial original work and outside reading.

**CRWT 151. Sports Journalism (4)** Lecture, 3 hours; interviewing and writing, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on writing articles, features, and editorials and provides the student with the tools to interview sports figures. Provides a well-rounded view of the print media.

**CRWT 152. Beginning Fiction Workshop (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): two of the following courses: CRWT 057A, CRWT 057B, CRWT 057C. Students discuss and analyze outside texts and original work from the class. Requires substantial original work.

**CRWT 155. The Graphic Novel (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 046A or CRWT 046B or CRWT 046C; CRWT 056; or consent of instructor. Explores the chronological development of the graphic novel. Focuses on theme, style, and artistic presentation. Course is repeatable as content changes to a maximum of 8 units.

**CRWT 160. Intermediate Poetry Workshop (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): CRWT 056, CRWT 150; or consent of instructor. Students produce and bring to class for analysis and commentary, a large quantity of original work in poetry. Course is repeatable to a maximum of 8 units.

**CRWT 162. Intermediate Fiction Workshop (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): CRWT 056, CRWT 152; or consent of instructor. Class work consists of intensive analysis of students' work. Course is repeatable to a maximum of 8 units.

**CRWT 164A. Beginning Playwriting (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): THEA 100 or CRWT 056 or consent of instructor. Seminar in the practice of playwriting centering on the construction of a plot. Cross-listed with THEA 164A.

**CRWT 164B. Intermediate Playwriting (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 164A/THEA 164A. Seminar in the practice of playwriting. Revisions of works in progress with emphasis on character development and techniques for writing dialogue. Cross-listed with THEA 164B.

**CRWT 164C. Advanced Playwriting (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 164B/THEA 164B. Seminar in the practice of playwriting. Playwrights' participation in staged readings of their work. With consent of instructor, course is repeatable to a maximum of 8 units. Cross-listed with THEA 164C.

**CRWT 165. Fundamentals and Concepts of Journalism (5)** Lecture, 3 hours; laboratory, 3 hours; outside research, 3 hours. Prerequisite(s): CRWT 056, CRWT 057C. An introduction to the journalistic writing process. Includes history, the role of journalism in modern society, function and form, editing principles, ethics, and legalities. Provides exposure to interviewing, story construction and organization, format options, and variations in style.

**CRWT 166B. Screenwriting: Outline to First Draft (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): CRWT 166A/MCS 166A/THEA 166A or consent of instructor. Explores the fundamentals of screenwriting. Includes story development, plotting, and characterization as they are used in creating a complete script for television or feature film. Cross-listed with MCS 166B and THEA 166B.

**CRWT 166C. Screenwriting: Rewrites and Writing for Television (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): CRWT 166B/MCS 166B/THEA 166B or consent of instructor. Explores the fundamentals of screenwriting. Includes story development, plotting, and characterization as they are used in creating a

complete script for television or feature film. Course is repeatable. Cross-listed with MCS 166C and THEA 166C.

**CRWT 167A. Plays in Production (4)** Workshop, 8 hours. Prerequisite(s): CRWT 164A/THEA 164A or THEA 166A or consent of instructor. Examines the development and preproduction of half-hour or one-hour plays written specifically for stage, soundstage, radio, television, or Web-based broadcasting. Explores the basics of sound and video production to enhance the writing and rewriting process. Course is repeatable to a maximum of 8 units. Cross-listed with THEA 165A.

**CRWT 167B. Plays in Production (4)** Workshop, 8 hours. Prerequisite(s): CRWT 167A/THEA 165A or consent of instructor. Advanced production and post-production of half-hour and one-hour drama (including comedy) for radio, video, or webcasting. Postproduction of previously taped shows. Course is repeatable to a maximum of 8 units. Cross-listed with THEA 165B.

**CRWT 170. Advanced Poetry Workshop (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): CRWT 056, CRWT 150, CRWT 160; or consent of instructor. A workshop in poetry writing for students who wish to attempt, with criticism from class members, to fashion a significant long poem or group of poems. Course is repeatable.

**CRWT 171. Anatomy of Poetry (4)** Lecture, 3 hours; creative writing, 3 hours. Prerequisite(s): CRWT 160 or consent of instructor. An introductory study of poetics, including traditional and contemporary forms. Students write in the various poetic forms studied.

**CRWT 172. Advanced Fiction Workshop (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): CRWT 056, CRWT 152, CRWT 162; or consent of instructor. A workshop in fiction writing for students who wish to attempt, with criticism from class members, to fashion a collection of stories or a novel. Course is repeatable.

**CRWT 173. Prose Poem Workshop (4)** Workshop, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores contemporary prose poetry. Studies the history of contemporary essays that define the mechanics and parameters of the prose poem. Requires substantial writing and critiquing. Course is repeatable as content changes to a maximum of 8 units.

**CRWT 174. Issues in Journalism (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores issues in contemporary news media, including credibility and bias, press freedom and responsibility, press-government relations, media coverage of politics, news media economics and influence on content, and race, gender, class, and news media. Course is repeatable to a maximum of 8 units.

**CRWT 175. Advanced Writing for Journalists (5)** Lecture, 3 hours; laboratory, 2 hours; outside research, 3 hours; extra reading, 1 hour. Prerequisite(s): CRWT 165 or consent of instructor. An examination of the techniques and styles representative of modern feature journalism. Writing assignments incorporate advanced reporting skills.

**CRWT 176 (E-Z). The Craft of Writing (4)** Lecture, 3 hours; extra reading, 1 hour; practice writing, 2-3 hours. Prerequisite(s): upper-division standing or consent of instructor. The formal study and practice of the craft of writing, its technical aspects and development through the contemporary period in the genres of poetry, fiction, playwriting, screenwriting, and journalism.

**CRWT 180. Professional Poetry Workshop (5)** Workshop, 3 hours; outside research, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 056, CRWT 150, CRWT 160, CRWT 170; or consent of instructor. A workshop in poetry writing for students who want to study poetry at the graduate and professional level. Focuses on producing and polishing work, and discusses the professional aspect of writing, such as submitting and publishing.

**CRWT 182. Professional Fiction Workshop (5)** Workshop, 3 hours; outside research, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 056, CRWT 152, CRWT 162, CRWT 172; or consent of instructor. A workshop in fiction writing for students who want to study fiction at the graduate and professional level. Focuses on producing and polishing work and discusses the professional aspect of writing, such as submitting and publishing.

**CRWT 185 (E-Z). Special Topics in Nonfiction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores style and craft in nonfiction. E. Literary Memoir. Each segment is repeatable as its content changes to a maximum of 8 units.

**CRWT 186A. Beginning Book Arts (4)** Lecture, 1 hour; laboratory, 6 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the elements of press operation. Using traditional letterpresses, students learn hands-on typesetting, design, material and text selection, editing, printing, and binding skills, as well as the history of the book and book design.

**CRWT 186B. Intermediate Book Arts (4)** Workshop, 1 hour; laboratory, 6 hours; consultation, 1 hour. Prerequisite(s): CRWT 186A; upper-division standing or consent of instructor. An expanded discussion of the techniques and styles in press operation. Students build on the techniques acquired in CRWT 186A and demonstrate finished projects.

**CRWT 187. Metafiction (4)** Lecture, 3 hours; creative writing, take-home midterm, or term paper, 30 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Covers postmodernism, metafiction, and the new novel in Europe and America. Creative writers submit fiction in lieu of a term paper or midterm. Cross-listed with CPLT 187.

**CRWT 190. Special Studies (1-5)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 16 units.

**CRWT 191. Seminar in Creative Writing (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): consent of instructor; upper-division standing. Intense study of the work of a visiting writer and poet. Students prepare individual papers for discussion. Course is repeatable to a maximum of 8 units. **Minot**

**CRWT 195. Senior Thesis (4)** Consultation, 1 hour; thesis, 3 hours; outside research, 3 hours; extra reading, 3 hours. Prerequisite(s): consent of department chair. Creation of a significant piece of work under faculty supervision. Project composed in the genres of poetry, fiction, or nonfiction.

**CRWT 195H. Senior Honors Thesis (4)** Consultation, 1 hour; outside research, 4 hours; extra reading, 3 hours; thesis, 4 hours. Prerequisite(s): consent of Department Chair. The student works independently with a faculty member to prepare a project. For the Creative Writing major, the project may be a group of poems, a long poem, a group of short stories, a novel, or a part of a novel. For the Journalism minor, the project may be a news feature, an investigative article, or a similar story requiring significant endeavor in

reporting and writing and demonstrating an understanding of sound journalistic technique.

**CRWT 198-I. Individual Internship (1-12)** field, 2 hours per unit. Prerequisite(s): consent of instructor; upper-division standing. Work with an appropriate professional individual or organization to gain experience and skills in any form of writing which meets with the approval of the Creative Writing Chair (e.g., journalism, radio journalism). Letter grading or Satisfactory (S)/No Credit (NC). Course is repeatable to a maximum of 16 units.

## Creative Writing and Writing for the Performing Arts

**Subject Abbreviation: CWPA, CWLR**  
**College of Humanities, Arts, and Social Sciences**

### Main Campus Traditional M.F.A

Robin Russin, M.F.A., Director  
Stuart Krieger, Advisor (Theatre)  
Michael Jayme, M.F.A., Advisor (Creative Writing)  
Program Office, ARTS 124  
(951) 827-5568  
[writingmfa.ucr.edu](http://writingmfa.ucr.edu)

### Main Campus Traditional M.F.A Faculty

#### Professors

Christopher Abani, Ph.D. (Creative Writing)  
D. Eric Barr, M.F.A. (Theatre)  
Christopher Buckley, M.F.A. (Creative Writing)  
Mike Davis, C.Phil. (Creative Writing)  
Stephanie Hammer, Ph.D., (Creative Writing)  
Juan Felipe Herrera, M.F.A. (Creative Writing)  
Richard Hornby, Ph.D. (Theatre)  
Stuart Krieger, B.A. (Theatre)  
Tom Lutz, Ph.D. (Creative Writing)  
Maurya Simon, M.F.A. (Creative Writing)  
Susan C. Straight, M.F.A. (Creative Writing)  
Haibo Yu, Ph.D. (Theatre)

#### Associate Professor

Reza Aslan, Ph.D. (Creative Writing)  
Charles Evered, M.F.A. (Theatre)  
Rickerby Hinds, M.F.A. (Theatre)  
Erith Jaffe-Berg, Ph.D. (Theatre)  
Michael Jayme, M.F.A. (Creative Writing)  
Laila Lalami, Ph.D. (Creative Writing)  
Tiffany Lopez, Ph.D. (Theatre)  
Robin Russin, M.F.A. (Theatre)  
Andrew Winer, M.F.A. (Creative Writing)

#### Assistant Professors

Claire Hoffman, M.A., M.S.J. (Creative Writing)  
Goldberry Long, M.A. (Creative Writing)  
Keun-Pyo "Root" Park, M.F.A. (Theatre)

### Palm Desert Low Residency M.F.A.

Tod Goldberg, M.F.A., Administrative Director (760) 834-0928  
Michelle Harding, Program Manager (760) 834-0926  
[www.palmdesertmfa.ucr.edu](http://www.palmdesertmfa.ucr.edu)

### Low Residency M.F.A. Core Faculty

Tod Goldberg, M.F.A. (Creative Writing)  
Mark Haskell Smith, M.F.A. (Creative Writing)  
Joshua Malkin, M.F.A. (Theatre)

Mary Otis, (Creative Writing)  
 William Rabkin, M.F.A., (Theatre)  
 Deanne Stillman, (Creative Writing)  
 David Ulin, B.A. (Creative Writing)  
 Mary Yukari Waters, M.F.A. (Creative Writing)  
 Matthew Zapruder, M.F.A. (Creative Writing)

## Graduate Program

### Master of Fine Arts

The Master of Fine Arts (M.F.A.) degree in Creative Writing and Writing for the Performing Arts (CWPA) offers writers the ability to move fluidly within various arenas of creative writing, including the genres of poetry, fiction, nonfiction, playwriting, and screenwriting, as well as in multimedia studies. The program integrates scholarly studies of narrative, style, voice, structure, and history of these writing disciplines with traditional workshop formats, forming writers who can actively direct the literature of the 21st century.

**For students in the Main Campus** Traditional M.F.A. program, financial assistance may include teaching assistantships and fellowships, as well as fellowships for community projects through the Gluck Fellows Program of the Arts, and positions with the *Los Angeles Review of Books* and the student-run literary magazine *Mosaic*.

**UCR Palm Desert Graduate Center (PDGC)** An M.F.A. in Creative Writing and Writing for the Performing Arts is offered at UCR's Palm Desert Graduate Center in Low Residency program. Students in the Low Residency program can receive limited financial assistance through editorial positions on *The Coachella Review*, the student run literary journal of the program.

**PDGC Low Residency Program** Students enroll in a prescribed number of units each term. Requirements are similar to the full-time program at UC Riverside, but courses are modified to fit low residency requirements. Low Residency MFA students come to Palm Springs, California for two ten-day sessions in the Fall and Spring quarters that include lectures, seminars, workshops and readings (please refer to website <http://www.palmdesertmfa.ucr.edu> for specific dates). Students also attend a final thesis residency their last quarter to file, continue their professional development series and present their Graduate Lectures. During the rest of the academic year, students participate in online workshops and seminars and work individually with faculty. Cross-enrollment between programs is not allowed. Students enroll for 8 units each term for 7 terms and pay a per unit fee.

**Admission** Applicants to either program should demonstrate significant professional skill by submitting in manuscript form one of the following: 10-15 pages of poetry, a maximum of 25 pages of fiction or nonfiction, or the first act or a maximum of 25 pages of a screen play or play. Applicants must have a B.A. or B.S. degree from an accredited institution and submit 3 letters of recommendation, a self-statement, and original transcripts. Applications for the Main Campus Traditional Program are accepted for Fall quarter only; applications for the Palm Desert Low Residency program are accepted for the Fall and Spring quarters.

**Plan I (Thesis) Both M.F.A. programs (Main Campus and PDGC Low Residency)** require completion of a thesis.

## Main Campus Traditional Program

Consists of workshops in chosen genres, culminating in a final project (the master's thesis) that showcases the writer's cultivated talents, in the form of a poetry collection, novel, memoir, screenplay, or full-length play. The M.F.A. requires students to major in one genre but encourages them to explore the other genres as well, allowing for creative movement within disciplines. Structure and focus in screenwriting and playwriting can also be applied to fiction and nonfiction, and lyricism and metaphor in poetry can also enhance description and dialogue in the other genres, for example. Students also engage in course work in varied areas of directing and acting, in film history and literature, in literary criticism and translation, with supplemental courses selected from departments such as Comparative Literature and Foreign Languages, English, Hispanic Studies, and Media and Cultural Studies. Students can gain practical aspects of filmmaking from courses in Studio Art and Theatre.

**Course Requirements** Minimum requirements consist of 56 units of course work (12 courses) and 8 units of master's thesis project. The core curriculum includes the following:

1. Four workshop courses in chosen genre (16 units total).
2. Two graduate seminars from Creative Writing and Writing for the Performing Arts (8 units).
3. Two graduate seminars from any department(s) outside of Theatre and Creative Writing. Seminar subject matter should be relevant to student's thesis project. Requirement can be met with upper-division courses, with instructor and graduate advisor approval, as an appropriate 292 course (8 units).
4. Four electives in workshop, graduate seminar or thesis, with the following limitations: Students may take a maximum of six workshops (24 units) within their chosen genre, and a maximum of 16 thesis units within the normative time to degree (six terms). Students are encouraged to take seminars or cross-genre workshops, as available; elective thesis units beyond the 8 required units must be approved by the student's thesis advisor and graduate advisor (16 units).
5. Thesis (8 units) In the areas of playwriting and screenwriting, the final written project is a full-length play of two or three acts (90-120 pages) or screenplay or teleplay (approximately 120 pages). In the areas of poetry, fiction, and nonfiction, the final written project is a poetry collection, novel, short story collection, or essay collection. Each student is paired with one or two faculty members who serve as thesis advisor(s). Two faculty readers, in addition to the advisor(s), evaluate the thesis work.

The length of the final project breaks down as follows: Poetry 50 – 100 pages, Fiction 100 – 150 pages, Creative Non-fiction 100 – 150 pages, screenplay, teleplay or play 90 – 130 pages.

**Normative Time to Degree** Main campus: 6 quarters;

**PDGC Low Residency Program** Consists of workshops in chosen genres and course work culminating in a final project (the master's thesis) which showcases the writer's cultivated talents, in the form of a poetry collection, novel, short story collection, essay collection, memoir, full-length work of nonfiction, screenplay, or full-length play. The M.F.A. requires students to write in two genres, allowing for creative movement within disciplines. Structure and focus in screenwriting and playwriting can also be applied to fiction and nonfiction, and lyricism and metaphor in poetry can also enhance description and dialogue in the other genres, for example. Students engage in course work in varied areas of directing and acting, in film history and literature, in literary criticism and translation. Requirements consist of 56 units of course work.

### Course Requirements

1. Six low residency genre workshop courses.
2. Six low residency literature, poetry, and film seminars.
3. Six low residency cross genre workshops.
4. Thesis. In the areas of playwriting and screenwriting, the final written project is a full-length play of two or three acts (90–120 pages) or screenplay or teleplay (approximately 120 pages). In the areas of poetry, fiction, and nonfiction, the final written project is a poetry collection (approximately 60 pages), novel, short story collection, essay collection, memoir or full-length nonfiction work (between 100-200 pages). Each student is paired with three faculty members who serve as the thesis advisor(s).

**Normative Time to Degree** 7 quarters

## Creative Writing Program

### Graduate Courses

*See also graduate courses in the Theatre section of this catalog.*

**CWPA 200. Advanced Play Analysis (4)** Seminar, 4 hours. Prerequisite(s): graduate standing or consent of instructor. An analysis of dramatic structure from a sophisticated perspective. Covers strategies for dealing with openness, ambiguity, and metatheatricality. Also discusses tied versus gratuitous elements, archetypes, motifs, and symbolism.

**CWPA 201. The Writer's Life: Literary Strategies and Structures (4)** Seminar, 3 hours; extra reading, 1 hour; outside research, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores the artistic, practical, and professional aspects of life as a working novelist, poet, playwright, screenwriter, or essayist. Topics include publishing, literary journals, commercial magazines, the film industry, the theatre industry, agents, and overviews of genre and art.

**CWPA 210. Literature and Improvisation: The Intersection of Culture and Performance (4)** Lecture, 3 hours; studio, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the literary and performative

tools needed to construct original, language-based plays. Combines improvisational performance with storytelling to challenge students to develop and explore the connectivity between cultural history, oral tradition passed on through personal narratives, and public discourse.

**CWPA 214. Acting for Writers (4)** Lecture, 2 hours; discussion, 2 hours; outside research, 2 hours. Prerequisite(s): CWPA 264 or CWPA 266. Examines the theory and practice of acting to enable writers to better understand how language reflects character, as well as how actors turn the written word into spoken language. Includes text work and improvisation. Credit is awarded for only one of CWPA 214 or THEA 114.

**Barr**

**CWPA 227. Theories of the Modern Theatre (4)** Seminar, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the major theories underlying twentieth-century theatre practice. Emphasizes the wide range of styles in modern theatre, including realism, symbolism, expressionism, surrealism, absurdism, Epic Theatre, and Theatre of Cruelty.

**CWPA 230. Creative Nonfiction (4)** Workshop, 3 hours; extra writing and reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of program chair is required for students with credit for CWLR 211N, CWLR 212N, CWLR 221N, or CWLR 222N. A formal study of contemporary creative nonfiction. Emphasizes style, structure, and form. Focuses on the production of original work. Course is repeatable to a maximum of 20 units.

**CWPA 231. Directing for Writers (4)** Seminar, 3 hours; extra reading, 1 hour; outside research, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An examination of the theory and practice of directing for the stage. Enables writers to better understand how to produce their own work and to interact more effectively with directors.

**CWPA 246. Special Topics in Fiction (4)** Seminar, 3 hours; extra reading, 3 hours; term paper, 1 hour. Prerequisite(s): graduate standing. Explores various movements and themes in literature. Course is repeatable as content changes to a maximum of 8 units.

**CWPA 250. Theory for Writers (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A survey of literary theory designed especially for creative writers. Focuses on aspects of various theories that might be useful for creative work. Involves a close reading of theoretical texts with a strong emphasis on issues of form.

**CWPA 251. Hollywood and the Novel: The Transformation of Fiction into Film (4)** Lecture, 2 hours; screening, 1 hour; extra reading, 2 hours; outside research, 2 hours; written work, 1 hour. Prerequisite(s): graduate standing. Explores the transformation of novels into screenplays and films. Examines four novels and their corresponding screenplays and films. Focuses on differences in style, content, and format. Course is repeatable as content changes to a maximum of 8 units.

**CWPA 252 (E-Z). Theory and Craft of Writing (4)** Seminar, 3 hours; outside research, 2 hours; extra reading, 1-2 hours. Prerequisite(s): graduate standing; consent of program chair is required for students with credit for a segment of CWLR 201 (E-Z) or a segment of CWLR 202 (E-Z). Analyzes writing techniques, structures, and approaches to the craft in traditional, contemporary, and avant-garde literary works. E. Fiction; F. Poetry; G. Nonfiction; I. Playwriting; J. Screenwriting; K. First Person. Each segment is repeatable to a maximum of 8 units.

**CWPA 253. Stories as Collections (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): gradu-

ate standing in Creative Writing and Writing for the Performing Arts. An analysis of the order, shape, and structure of story collections to aid in an appreciation of characters, conflicts, and themes. Course is repeatable as content changes to a maximum of 8 units.

**CWPA 255. The Graphic Novel (4)** Seminar, 2 hours; studio, 2 hours; extra reading, 1.5 hours; outside research, 1.5 hours. Prerequisite(s): graduate standing. An in-depth consideration of the historical development and craft of graphic novels. Examines the intellectual, literary, and artistic evolution of this narrative form.

**CWPA 256. Contemporary Literature of the Middle East (4)** Seminar, 3 hours; extra reading, 3 hours; term paper, 1 hour. Prerequisite(s): graduate standing. An overview of contemporary literature from the Middle East. Proposes some of the ways in which the historical and cultural aspects of Islamic literature differ from that of Western culture. Includes English translations of works in Arabic, Persian, Turkish, Dari, and Urdu. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CWPA 257. The Sufis (4)** Seminar, 3 hours; term paper, 2 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to sufism through an in-depth reading of the great Sufi poets. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CWPA 262. Fiction (4)** Workshop, 3 hours; extra writing and reading, 4 hours. Prerequisite(s): graduate standing or consent of instructor; consent of program chair is required for students with credit for CWLR 211F, CWLR 212F, CWLR 221F, or CWLR 222F. A formal study of contemporary fiction. Emphasizes style, structure, and form. Focuses on production of original work. Course is repeatable to a maximum of 20 units.

**CWPA 263. Fiction Workshop (4)** Workshop, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing. A comprehensive introduction to the craft of fiction writing. Develops fiction writing abilities and critiquing skills of the genre. Intended for students whose primary emphasis is not fiction. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CWPA 264. Playwriting (4)** Workshop, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Intensive formal study of playwriting with emphasis on plot, character, theme, dialogue, and style. Course is repeatable.

**CWPA 265A. Four Forms (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Explores similarities and differences of three kinds of creative writing: fiction, playwriting, and screenwriting. Includes participation in live stagings and video shoots, translating stories from one form to another to highlight the unique qualities of each form as well as areas of commonality. Course is repeatable.

**CWPA 265B. Four Forms (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): CWPA 265A; graduate standing. Includes adaption of a one-act play into a screenplay not longer than 15 pages. Demonstrates how to develop work dependent on dialogue into work dependent on visuals and action. Covers shooting, editing, and screening of short films. Course is repeatable.

**CWPA 266. Screenwriting (4)** Workshop, 3 hours; consultation, 1 hour; screening, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Involves outline and completion of an initial draft of a feature-length screenplay. Also includes a comparison study of two movies in the same genre. Course is repeatable.

**CWPA 267. Writing for Television (4)** Workshop, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor; consent of program chair is required for students with credit for CWLR 211S, CWLR 212S, CWLR 221S, or CWLR 222S. Provides intensive formal study of writing for television. Emphasizes creating guidelines for a one-hour pilot and a 13-episode series. Course is repeatable to a maximum of 24 units.

**CWPA 269. Rewriting the Script (4)** Workshop, 4 hours. Prerequisite(s): CWPA 264 or CWPA 266 or consent of instructor; consent of instructor is required for students repeating the course. Addresses the processes involved in rewriting a full-length script (screenplay or play). Course is repeatable to a maximum of 8 units. Credit is awarded for only one of CWPA 269 or THEA 169.

**CWPA 270. Poetry Workshop (4)** Consultation, 1 hour; workshop, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal study of contemporary poetry with emphasis on style, structure, and form. Focuses on production of original work. Course is repeatable.

**CWPA 275. Modern American Poetry (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): graduate standing. Focuses on various modern poets. Explores their contributions to the evolution of an American poetic tradition and aesthetic. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 8 units. **Simon**

**CWPA 276. Poetry and Translation (4)** Workshop, 3 hours; extra reading, 1.5 hours; outside research, 1.5 hours. Prerequisite(s): graduate standing; reading proficiency in Spanish. Discusses the efficacy and difficulty of translating poetry from the Spanish language into English. Explores the works of twentieth- and twenty-first century major Spanish language poets. Provides a forum to render and compare translations. Cross-listed with SPN 277.

**CWPA 277. Poetry and the Sacred (4)** Seminar, 2 hours; extra reading, 2 hours; outside research, 2 hours; written work, 2 hours. Prerequisite(s): graduate standing. An in-depth introduction to sacred poetic texts from antiquity to the present. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CWPA 278. Contemporary American Poetry (4)** Workshop, 3 hours; extra reading, 3 hours; written work, 1 hour. Prerequisite(s): graduate standing. Focuses on influential contemporary American poets. Discusses their styles and the evolution of poetry over the last fifty years. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 8 units.

**CWPA 279. The Fire This Time: Twentieth-Century Poetry of Witness (4)** Seminar, 3 hours; extra reading, 1 hour; outside research, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing. Examines the poetry of crises and witness written by poets in the twentieth and twenty-first centuries from America and around the world. Topics may include war; genocide; religious, ethnic, and political persecution; exile; imprisonment; ecological degradation; and domestic and urban violence in the United States.

**CWPA 280. Writers' Colloquium (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing. Colloquia featuring writers in fiction, nonfiction, poetry, playwriting, and screenwriting. Students who present a semi-

nar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 6 units.

**CWPA 281. Oscar Wilde and Late Victorian Theatre (4)** Seminar, 4 hours. Prerequisite(s): graduate standing or consent of instructor. A study of late Victorian theatre and culture through the works of Oscar Wilde (1854-1900), an Irish, feminist, aesthete, socialist, homosexual Victorian author. Includes readings of Wilde's plays and nondramatic writings as well as plays by contemporaries such as Ibsen and Shaw.

**CWPA 282. Film Noir: Stories and Cinema from the Shadows (4)** Seminar, 3 hours; screening, 2 hours; outside research, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the genre of fiction and cinema known as "film noir." Looks at films, writing, and art to understand how "film noir" reshapes the way America looks at itself. Each week examines a different aspect of the genre, combining readings and films to understand its roots and rules.

**CWPA 283. Multigenre Workshop (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A peer-review workshop for students with ongoing projects in any and all genres. Focuses on student work that can profit from exposure to readings by people working in a number of different genres. Course is repeatable to a maximum of 16 units.

**CWPA 284. Intensive Workshop (1-2)** Workshop, 10-12 hours per quarter; discussion, 10-12 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Explores the work of contemporary writers and provides an opportunity for those same writers to respond to the students' work. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

**CWPA 285. The Literary Memoir (4)** Workshop, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. An in-depth survey of the literary memoir. Explores how memoirists employ craft and memory to create meaning. Addresses what obligation memoirists have to drama and to real lives and places. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**CWPA 288. Thesis Workshop (4)** Workshop, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Designed for M.F.A. students working on their thesis, usually in the last two quarters of the program. Open to any and all genres. Focuses on student work, emphasizing the completion of thesis projects.

**CWPA 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Literature studies directed by a faculty member on special topics. Course is repeatable.

**CWPA 292. Concurrent Analytical Studies in Creative Writing and Writing for the Performing Arts (1-4)** Outside research, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Taken concurrently with a 100-series course but on an individual basis. Devoted to research, criticism, and written work related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CWPA 299. Research for the Thesis (1-12)** Thesis, 3-36 hours. Prerequisite(s): consent of thesis director. Research and preparation for the Master of Fine Arts thesis. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**CWPA 301. Directed Studies in the Teaching of Creative Writing and Writing for the Performing Arts (4)** Lecture, 2 hours; practicum, 1 hour; outside research, 2 hours; written work, 3 hours. Prerequisite(s): enrollment in the M.F.A. program in Creative Writing and Writing for the Performing Arts. Prepares for teaching introductory undergraduate Creative Writing courses by offering a flexible curriculum of meetings and conferences on effective pedagogical methodology. Includes creating course syllabi and lesson plans and discussing a range of practical teaching issues. Required of all TAs for at least one quarter. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

**CWPA 302. Teaching Practicum (1-4)** Consultation, 1-4 hours; practicum, 2-8 hours. Prerequisite(s): graduate standing. Supervised teaching in undergraduate Creative Writing courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Palm Desert Low Residency Program

### Graduate Courses

*See also graduate courses in the Theatre section of this catalog.*

**CWLR 201 (E-Z). Low Residency Seminar in Literature, Theatre, and Film (4-6)** Seminar, 21-31.5 hours per quarter; consultation, 1-1.5 hours; extra reading, 3-4.5 hours. Prerequisite(s): graduate standing. A study of a period, style, author, or issue in relation to literary, theatrical, or film history. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Each segment is repeatable as its content changes to a maximum of 16 units.

**CWLR 202 (E-Z). Low Residency Seminar in Literature, Theatre, and Film (2-4)** Seminar, 1-2 hours; extra reading, 3-6 hours. Prerequisite(s): graduate standing. A study of a period, style, author or issue in relations to literary, theatrical, or film history. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. (Each segment is repeatable as its content changes to a maximum of 4 units.)

**CWLR 211 (E-Z). Low Residency Genre Workshop (2-4)** Workshop, 10-20 hours per quarter; consultation, 1-2 hours. Prerequisite(s): graduate standing. Focuses on the production of original work. Involves study of chosen genre(s), emphasizing technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Each segment is repeatable as its content changes to a maximum of 8 units. If credit has already been awarded for a segment of CWLR 221 (E-Z) or CWLR 222 (E-Z), it is not awarded for the corresponding lettered segment of CWLR 211 (E-Z) or CWLR 212 (E-Z).

**CWLR 212 (E-Z). Low Residency Genre Workshop (4-6)** Workshop, 3-4.5 hours; extra reading, 3-4.5 hours. Prerequisite(s): graduate standing. Focuses on the production of original work. Involves study of chosen genre(s), emphasizing technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Each segment is repeatable as its content changes to a maximum of 8 units. If credit has already been awarded for a segment of CWLR 221 (E-Z) or CWLR 222 (E-Z), it is not awarded

for the corresponding lettered segment of CWLR 211 (E-Z) or CWLR 212 (E-Z).

**CWLR 221 (E-Z). Low Residency Cross-Genre Workshop (2-4)** Workshop, 10-20 hours per quarter; consultation, 1-2 hours. Prerequisite(s): graduate standing. Focuses on the production of original work. Includes introductory study of chosen cross-genres. Emphasizes technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Each segment is repeatable as its content changes to a maximum of 8 units. If credit has already been awarded for a segment of CWLR 211 (E-Z) or CWLR 212 (E-Z), it is not awarded for the corresponding lettered segment of CWLR 221 (E-Z) or CWLR 222 (E-Z).

**CWLR 222 (E-Z). Low Residency Cross-Genre Workshop (2-4)** Workshop, 1-2 hours; extra reading, 3-6 hours. Prerequisite(s): graduate standing. Focuses on the production of original work. Includes introductory study of chosen cross-genres. Emphasizes technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Each segment is repeatable as its content changes to a maximum of 4 units. If credit has already been awarded for a segment of CWLR 211 (E-Z) or CWLR 212 (E-Z), it is not awarded for the corresponding lettered segment of CWLR 221 (E-Z) or CWLR 222 (E-Z).



# Dance

**Subject abbreviation: DNCE**

**College of Humanities, Arts, and Social Sciences**

Linda Tomko, Ph.D., Chair  
Department Office, 125 Arts  
(951) 827-3944; [dance.ucr.edu](http://dance.ucr.edu)

## Professors

Wendy L. Rogers, M.A.  
Susan Rose, M.F.A.  
Marta Savigliano, Ph.D.

## Professors Emeriti

Fred Strickler, B.S.  
Christena Lindborg Schlundt, Ph.D.

## Associate Professors

Anthea Kraut, Ph.D.  
Jacqueline Shea Murphy, Ph.D.  
Priya Srinivasan, Ph.D.  
Linda J. Tomko, Ph.D.

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## Lecturer

Kelli King, M.F.A.

## Cooperating Faculty

Derek Burrill, Ph.D. (Media and Cultural Studies)  
Erika Suderburg, M.F.A. (Art)

## Major

The Dance major is distinctive for its outstanding faculty of nationally recognized scholars and artists who draw from a variety of academic and creative backgrounds, including choreography, history, literature, performance studies, and cultural studies.

The B.A. degree in Dance focuses on choreography and cultivation of cultural and historical perspectives on dance. Movement practices, dance composition, performance, and cultural and historical studies, courses are required. Elective courses are also required. Movement practice courses are offered in dance/movement forms as they are practiced in various cultures of the world. Dance majors must participate in at least one production season of "UCR is Dancing," the department's annual concert series featuring original choreography and performance projects by students. This concert series also includes historical dance reconstructions by department faculty as well as original repertory created by professional guest artists.

In addition, visiting professional dancers, choreographers, and scholars come to UCR frequently to give special workshops, master classes, and lectures.

Opportunities to perform include "UCR is Dancing," the Faculty Dance Concert, the Graduate Dance Concert, and the Gluck Fellows Arts Outreach Touring programs.

New majors are eligible to audition for the Chancellor's Performance Award, a scholarship of up to \$3,000. Student assistantships and other forms of financial aid are also available. Undergraduate majors may apply for research grants and stipends for summer dance studies. Selected students receive \$1,000 Maxwell H. Gluck Fellowships.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Dance are as follows: A minimum of 74 units of course work in Dance, 38 of which are upper division.

- Lower-division requirements (8 units):  
DNCE 014, DNCE 019
- Choreographies (12 units): DNCE 114A, DNCE 114B, DNCE 114C
- Histories/Cultures (8 units), 2 courses from:  
DNCE 131/WMST 127, DNCE 132, DNCE 133, DNCE 134, DNCE 135
- Performance/Productions (10 units):  
DNCE 167, DNCE 180G, and one quarter of DNCE 180J
- Movement Practice (up to 24 units)  
Dance majors must enroll in at least one movement practice course per quarter, and must pursue a concentration in two different dance genres of at least 6 units each. Up to 24 units may be counted towards the major from:
  - DNCE 067A, DNCE 067B, DNCE 067C (Modern Technique)
  - DNCE 071A, DNCE 071B (Ballet)  
DNCE 073A/LNST 073A, DNCE 073B/LNST 073B (Dance of Mexico)  
DNCE 075A, DNCE 075B (World Dance Forms)  
DNCE 081A, DNCE 081B, DNCE 081C (Dance Cultures, Culture in Dance)

- Electives (12 units) 12 units of additional coursework as follows:
  - At least 8 units must be drawn from the following upper division courses:  
DNCE 131/WMST 127, DNCE 132, DNCE 133, DNCE 134, DNCE 135, DNCE 155 (E-Z), DNCE 161/MCS 162, DNCE 162/MCS 162, DNCE 171 (E-Z), DNCE 172 (E-Z), DNCE 173 (E-Z), DNCE 180R
  - No more than 4 units may be drawn from the following movement practice and dance practicum courses:  
DNCE 067A, DNCE 067B, DNCE 067C, DNCE 071A, DNCE 071B, DNCE 073A/LNST 073A, DNCE 073B/LNST073B, DNCE 75A, DNCE 075B, DNCE 081A, DNCE 081B, DNCE 081C, DNCE 168, DNCE 180J, DNCE 180K

## Minor

Students who minor in Dance receive an introduction to choreography, movement practice, and cultural and historical studies of dance that enable them to pursue upper-division courses germane to a particular focus in dance.

- Lower-division preparation (14 units)
  - DNCE 014, DNCE 019
  - Six (6) units from movement practice courses: DNCE 067A, DNCE 067B, DNCE 067C, DNCE 071A, DNCE 071B, DNCE 072A, DNCE 072B, DNCE 072C, DNCE 073A/LNST 073A, DNCE 073B/LNST 073B, DNCE 075A, DNCE 075B, DNCE 081A, DNCE 081B, DNCE 081C
- Upper-division requirements (16 units):  
4 courses from DNCE 114A, DNCE 114B, DNCE 114C, DNCE 131/WMST 127, DNCE 132, DNCE 133, DNCE 134, DNCE 135, DNCE 161/MCS 161, DNCE 162/MCS 162, DNCE 171 (E-Z), DNCE 172 (E-Z), DNCE 173 (E-Z), DNCE 180 (E-Z)

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Graduate Program

The Department of Dance offers a Master of Arts (M.A.) in Critical Dance Studies, a Master of Fine Arts (M.F.A.) in Experimental Choreography, and a Ph.D. in Critical Dance Studies.

## Master's Degrees

### M.A. in Critical Dance Studies

**Admission** Students gaining admission to the Ph.D. program in Critical Dance Studies may, after advisement and with the approval of the faculty committee, elect to pursue an M.A. degree in Critical Dance Studies.

**Plan I (Thesis)** Students must complete a minimum of 36 quarter units of undergraduate (100 series) and graduate (200 series) courses. At least 24 of these units must be in graduate courses and must include the following UCR courses:

- DNCE 254 (Political Approaches to Dance Studies)
- DNCE 255 (Historical Approaches to Dance Studies)
- DNCE 257 (Rhetorical Approaches to Dance Studies)
- DNCE 258 (Cultural Approaches to Dance Studies)

A maximum of 12 units of DNCE 299 (thesis research) can be counted towards the 36-unit minimum. Other courses (to fulfill the 36-unit requirement) should be selected, with the consent of the program graduate advisor, from relevant upper-division and graduate courses.

Candidates for the degree must prepare and present an acceptable thesis to the Department of Dance.

### M.F.A. in Experimental Choreography

The Master of Fine Arts (M.F.A.) program in Experimental Choreography constructs

opportunities for highly motivated choreographers to conduct both research in dance and an assessment of contemporary issues in dance aesthetics, history, and culture. The focus of this program is the development of experimental choreography that challenges cultural assumptions and is informed by a critical and reflective perspective. Core courses focus on what constitutes an experiment in contemporary dance, improvising choreography, systems of representation used to create choreographic meaning, and the collaborative process. Through close cooperation with the Ph.D. program in Critical Dance Studies, students explore the dynamic relationships between theory, method, and object of study. A final project demonstrates a thorough investigation and committed execution of a defined choreographic problem. Financial assistance includes teaching assistantships and fellowships for community projects through the Gluck Fellows Program of the Arts.

**Admission** Applicants to the program should demonstrate significant professional experience as an active choreographer making and producing work, must have a B.A. or B.F.A. degree from an accredited institution. It is recommended that applicants take the GRE if their GPA is below a 3.0. A video sample of choreography is required. Contact the department for specific details. The program is especially designed for the practicing artist who desires to return to an institutional context for advanced study.

The program seeks applicants who desire to contextualize their aesthetic inquiry through the study of historical, cultural, and political perspectives on dance. Students will be asked to examine their own artistic production from these various perspectives, as they produce new work. They will be involved in a rigorous investigation of contemporary aesthetic issues as formulated in their own research projects.

**Course Work** Requirements consist of 40 units of course work (10 courses) and 12 units of independent research for a final project. The core curriculum, normally to be completed in the first two years of residency, shall comprise the following 16 units:

DNCE 240 (Improvising Choreography: Scores, Structures, and Strategies)

DNCE 241 (Creating the Experiment: Identifying the New)

DNCE 242 (Dancing Representation: Figures, Forms, and Frames)

DNCE 243 (Collaborating in Dance Making: Materials, Methods, and Interactions)

In addition, students must complete 16 units from the following Critical Dance Studies courses:

DNCE 254 (Political Approaches to Dance Studies)

DNCE 255 (Historical Approaches to Dance Studies)

DNCE 257 (Rhetorical Approaches to Dance Studies)

DNCE 258 (Cultural Approaches to Dance Studies)

One 4-unit DNCE 200-level seminar course in history and theory, excluding DNCE 280 and DNCE 290 to DNCE 299.

Students must take 8 graduate-level units of electives, to be determined in consultation with their chair, that are relevant to their specific research project. These courses should be taken for a letter grade and can include graduate-level seminars within or outside of the department, Dance 280 (the Colloquium), or the bundling of an upper division 4 unit undergraduate-level course with 2 units of 292, Concurrent Analysis, (which would be worth 4 graduate units).

An additional 12 units are taken through DNCE 297 or DNCE 299 for work on phases of the final project. During the second year, students form a committee consisting of three faculty members, one of whom may be outside the department. The committee approves the project proposal and supervises the final project. The student's progress through the program culminates in the final project, which reflects a serious investigation of a specific choreographic problem.

**Foreign Language Requirement** None

**Written and/or Oral Qualifying Examination**

During the second year, the student writes a 5–15-page proposal for the final project to be approved by the committee.

**Final Project** The final project could take the form of a concert of dances or some other performance event in which the student's research is made evident. Because of the experimental nature of the program, it is difficult to specify the exact form the project may take. For example, students may 1) undertake to create site-specific dances occurring in different locales over several months, 2) organize opportunities for interactive choreography with distinct groups of performers, or 3) choreograph a dance to be viewed on CD-ROM. Whatever its final form, the project must demonstrate a thorough investigation and committed execution of a defined aesthetic concern. The final project includes a written requirement to be completed within one quarter following the performance event. This document, 20-40 pages long, outlines the aesthetic focus of the student's research and provides a historical and philosophical contextualization for the project.

**Normative Time to Degree** 9 quarters

## Doctoral Program

### Ph.D. in Critical Dance Studies

The Ph.D. program in Critical Dance Studies provides an advanced interdisciplinary base for innovative research in the field of cultural, political, and historical studies of dance. The

program of study embraces a theoretical consideration of all dimensions of the practice of dance. These dimensions include, but are not limited to, body politics; media and digital cultures; globalization and cultural translation; race, ethnicity, sexuality, and gender; mobilization and class; and corporeal knowledges and choreography. In addition to theoretical and historical concerns, the program promotes the articulation of a variety of methodological approaches to the analysis of bodily performance.

UCR faculty put into motion various modes of production: performance studies, history, ethnography, critical race theory, feminist studies/masculinities & queer studies, Marxism or post-Marxism, and other specific area studies related to, for example, South Asian, Asian Diaspora and Asian American studies, African Diaspora studies, Indigenous studies, Latina/Latin American studies, and Global South studies. The program provides a provocative environment for investigating cutting-edge strategies for original scholarly work in dance.

**Admission** Students must meet the general requirements for admission to the Graduate Division as shown in the Graduate Studies section of this catalog. Students may submit a statement of background about experience in dance history and theory, a previously prepared research paper, or the equivalent, demonstrating analytical and interpretive skills, and GRE scores.

Prerequisites include the following:

1. A working knowledge of movement
2. An acquaintance with some system of movement observation and analysis
3. Preparation in general historical and cultural studies

Deficiencies may be corrected with appropriate course work.

**Course Work** Core curriculum normally to be completed in the first two years of residency includes the following:

DNCE 254 (Political Approaches to Dance Studies)

DNCE 255 (Historical Approaches to Dance Studies)

DNCE 257 (Rhetorical Approaches to Dance Studies)

DNCE 258 (Cultural Approaches to Dance Studies)

Six additional graduate-level courses are required. Two from other disciplines related to the student's research interest, and four from Dance. A maximum of one Dance M.F.A. core course may be included as one of the four additional graduate-level dance courses required.

**Language Requirement** All students must show competence in at least one language other than

English. Further requirements in specific forms of dance or music notation or ancient or contemporary languages may be determined for each student in consultation with relevant faculty and the graduate advisor of the program.

**Written Qualifying Examination** Students must prepare one field for examination with each of four members of the committee in whose courses the student has completed degree requirements. The committee is composed of two Dance faculty members, one of whom is chair, and two other members who may be Dance faculty or "outside members" (not a UCR Dance faculty member or cooperating faculty member). The written qualifying examination may be completed as a "take-home" format (seven-day, open-book) or a "sit-in" format (two-hour exam periods for each field, conducted on site in the department, and completed in one five-day work week).

**Qualifying Essay** One quarter after successfully completing the written examination, students complete a rough draft of the qualifying essay, under the direction of the same group of faculty members who monitored the written examination. Students finalize the qualifying essay and sit for the oral examination before the end of the following quarter. The qualifying essay is generally 25 pages in length and demonstrates the student's ability to articulate a viable dissertation research project. It must consist of written work but may include other forms of video or film productions with the approval of the relevant committee and the graduate advisor.

**Oral Qualifying Examination** Students must prepare qualifying essay and be examined by a five-person oral qualifying examination committee. The committee, nominated by the department and appointed by the dean of the Graduate Division, consists of all four written examination committee members, plus a fifth member chosen so that the five-person committee would be comprised of no more than two "outside faculty members," and no fewer than one "outside faculty member." All members of the committee must be physically present for the exam. The committee examines the adequacy of the student's preparation to conduct the research proposed in the qualifying essay. Advancement to candidacy for the doctoral degree depends on completing required course work, fulfilling language requirements, and passing the written examination, qualifying essay, and the oral examination.

The Dance department expects students to complete the entire examination process by the end of their tenth quarter in the program (end of the first quarter of their fourth year) to make satisfactory progress toward completing the degree.

**Dissertation and Final Oral Examination** A dissertation committee is composed of three members: a chair from Dance, a Dance faculty member, and either a Dance faculty member, or an outside faculty member. The committee directs and approves the research and writing of the dissertation. The dissertation must

consist of written work but may include other forms of video or film productions with the approval of the relevant committee and the graduate advisor. It must present original scholarly work and be approved by the dissertation committee before the student takes the final oral examination. Students must have satisfactory performance on a final oral examination, conducted by the dissertation committee and open to all members of the faculty. The examination emphasizes the dissertation and related topics.

**Normative Time to Degree** 18 quarters

## Lower-Division Courses

**DNCE 005. Introduction to Dance (4)** Seminar, 3 hours; individual study, 1 hour; extra reading, 1 hour; several short essays. As a survey of approaches to dancing and dance making, this course introduces students to dance technique, performance, and composition as fundamental components in the art of dance. Students will cultivate the ability to enact and remember patterns of rhythm, effort, and visual design in movement and will become acquainted with various procedures for organizing movement. Especially designed for students with no experience in dance.

**DNCE 007. Dance: Cultures and Contexts (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of leading dances, dance companies, choreographers, and dancers of the Western world during the twentieth century through slides, films, demonstrations, and performances. Intended for nonmajors.

**DNCE 014. Introduction to Choreography (4)** Lecture, 4.5 hours; individual study, 1.5 hours. Prerequisite(s): a major or minor in Dance or consent of instructor. Analysis of basic problems and issues of choreography. Emphasis is on improvisational methods as an approach to the investigation of space, time, and energy in motion as the fundamental elements of a dance. Course is repeatable to a maximum of 8 units.

**DNCE 019. Introduction to Dance Studies (4)** Lecture, 3 hours; outside research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): none. Introduces major concepts, approaches, and issues in the study of dance as a cultural, historical, and artistic practice. Uses text, video, studio, demonstration, and performance to expose students to ways of writing, speaking, researching, and thinking clearly and critically about dance.

**DNCE 067A. Beginning Modern Dance Technique (2)** Studio, 3 hours; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): none. Modern dance technique at the beginning level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 067B. Intermediate Modern Dance Technique (2)** Studio, 4.5 hours; individual study, 1.5 hours. Prerequisite(s): DNCE 067A recommended. Modern dance technique at the intermediate level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor

for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 067C. Advanced Modern Dance Technique (2)** Studio, 4.5 hours; individual study, 1.5 hours. Prerequisite(s): DNCE 067B recommended. Modern dance technique at the advanced level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 068. Somatic Techniques and Experiential Anatomy (2)** Studio, 3 hours; extra reading, 1 hour; individual studio, 2 hours. Introduces physical practices and concepts from a variety of somatic techniques. Explores how the body functions through actions and interactions of its structures. Utilizes a possibilities-in-the-field approach to study and embody some of the varied interpretations that can arise from the same set of anatomical facts. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units. **Greenberg**

**DNCE 071A. Beginning Ballet Technique (2)** Studio, 3 hours; screening, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): none. Ballet technique at the beginning level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 071B. Intermediate Ballet Technique (2)** Studio, 3 hours; screening, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): DNCE 071A recommended. Ballet technique at the intermediate level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 072A. Beginning Tap Dance Technique (2)** Studio, 3 hours; screening, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): none. Tap technique at the beginning level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 072B. Intermediate Tap Dance Technique (2)** Studio, 3 hours; screening, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): DNCE 072A recommended. Tap technique at the intermediate level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 072C. Advanced Tap Dance Technique (2)** Studio, 3 hours; screening, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): DNCE 072B recommended. Tap technique at the advanced level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular

individual practice sessions. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 075A. Beginning World Dance Forms (2)** Studio, 3 hours; screening, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): none. Traditional ethnic dances at the beginning level. Focus is on a specific cultural region each quarter. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 075B. Intermediate World Dance Forms (2)** Studio, 3 hours; screening, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): DNCE 075A recommended. Traditional ethnic dances at the intermediate level. Focus is on a specific cultural region each quarter. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**DNCE 081A. Dance Cultures, Culture in Dance (4)** Lecture, 2 hours; studio, 6 hours. Explores non-presentational dance forms that are intricately woven into the culture of a particular society, with attention to performance integrity and cultural memory. Uses videos, books, field trips, and guest lectures in addition to studio time. Course is repeatable.

**DNCE 081B. Dance Cultures, Culture in Dance: Intermediate Level (4)** Lecture, 2 hours; studio, 3 hours; field, 30 hours per quarter. Prerequisite(s): DNCE 081A or consent of instructor. Focuses on dances within one performance cycle, their meanings, their stories, their base rhythms, and their songs. Working with a master dancer, students study the oral history of a dance form and compare and contrast elements of the corresponding written record. Course is repeatable.

**DNCE 081C. Dance Cultures, Culture in Dance: Advanced Level (4)** Lecture, 1 hour; individual study, 3 hours; field, 30 hours per quarter; studio, 3 hours. Prerequisite(s): DNCE 081B or consent of instructor. Focuses on identification and execution of the dances of one performance cycle and examination of their concomitant cultural manifestations, including cuisine, costume, rhythm, seasonal considerations, type of dance, song lyrics, age grade, and ritual connections. Course is repeatable.

## Upper-Division Courses

**DNCE 114A. Dance Composition I (4)** Lecture, 3 hours; studio, 3 hours. Prerequisite(s): DNCE 007 or DNCE 014 and two quarters of dance technique, or equivalent. The continuing analysis of dance as an art form with emphasis on space, time and energy in motion as elements in choreographic style. In 114A, this is done on the beginning level.

**DNCE 114B. Dance Composition II (4)** Lecture, 3 hours; studio, 3 hours. Prerequisite(s): DNCE 114A. The continuing analysis of dance as an art form with emphasis on space, time and energy in motion as ele-

ments in choreographic style. In 114B, this is done on the intermediate level.

**DNCE 114C. Dance Composition III (4)** Lecture, 3 hours; studio, 3 hours. Prerequisite(s): DNCE 114B. The continuing analysis of dance as an art form with emphasis on space, time and energy in motion as elements in choreographic style. In 114C, this is done on the advanced level.

**DNCE 120. Introduction to Labananalysis (4)** Lecture, 2 hours; discussion, 1 hour; extra reading, 2 hours; observation and composition problems, 1 hour. Prerequisite(s): DNCE 014 and upper-division standing or consent of instructor. This course examines concepts and theories of the Labananalysis method of observing, recording, and analyzing human body movement. Special attention will be given to the paradigms and notation methods comprising Effort theory, Shape theory, and Space Harmony theory.

**DNCE 123. Southeast Asian Performance (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed both as a time-honored and as a contemporary medium for cultural production, from the courts to everyday experience. Material will be drawn from the Philippines, Malaysia, Indonesia, Thailand, Laos, Cambodia, Vietnam, Burma, Singapore, and the Southeast Asian diaspora. Cross-listed with ANTH 126, AST 123, and MUS 123.

**DNCE 127. Music Cultures of Southeast Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with ANTH 176, AST 127, ETST 172, and MUS 127.

**DNCE 128. Performing Arts of Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in four major geocultural regions of Asia: Central, East, South, and Southeast. No Western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with ANTH 128, AST 128, MUS 128, and THEA 176.

**DNCE 130. Cross-Cultural Perspectives on Dance (4)** Lecture, 2 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. With a view to understanding dance from a global perspective, course will survey anthropological writings on dance traditions found around the world. Topics covered include dance as an expression of social organization and social change, dance as a religious experience, and dance as play/sport. Cross-listed with ANTH 130.

**DNCE 131. Dance, Gender, Sexuality (4)** Lecture, 3 hours; outside research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores some of the ways that studying dance, an art form whose medium is the body, illuminates feminist, gender, and sexuality studies — and vice versa. Includes weekly video screenings and readings. No previous dance experience required. Cross-listed with WMST 127.

**DNCE 132. Dance, Citizenship, Location (4)** Lecture, 3 hours; outside research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores interconnections between dancing bodies, their geographical, political, cultural locations, and the ways in which they negotiate inclusion or exclusion within state apparatuses of power such as citizenship.

**DNCE 133. Dance, Space, Time (4)** Lecture, 3 hours; outside research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores the flow among non-presentational and presentational dance forms, state productions and treaties, and design factors that are meant to enable our daily lives such as buildings, parks, and roadways. Students take advantage of video, books, field trips, guest lectures and studio lab time.

**DNCE 134. Dance, Genre, Institutions (4)** Lecture, 3 hours; outside research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores how dance and movement genres interact with and articulate, but also query and contest, structures, institutions, and traditions such as theatrical performance and touring shows, rites of passage, political contests, educational enterprises, and territorial campaigns through which societies frame experience.

**DNCE 135. Dance, Race, Property (4)** Lecture, 3 hours; outside research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores intersections between dancing bodies, questions of race, and notions of cultural property. Investigates issues of embodied identity and racialization, cultural appropriation and cultural exchange, purity and hybridity, and ownership and copyright.

**DNCE 141. History of Ballet (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): none. Art dance from the Italian Renaissance through the ballets of contemporary dance.

**DNCE 142. History of Modern Dance (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): none. Art dance from Isadora Duncan to Martha Graham and descendants.

**DNCE 155 (E-Z). Seminar in Dance and Music (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces relationships and representations between music and dance. Explores musical and choreographic form, compositional strategies, hybridization of style, cultural meanings and registers in which these were made, the agencies such representations enabled, interpretive communities, and cross-cultural interactions. Cross-listed with MUS 155 (E-Z).

**DNCE 161. Choreographing the Screen (4)** Lecture, 3 hours; screening, 2 hours; term paper, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Focuses on choreographing for the camera and the screen. Topics include video art, classic film choreography, music video, and digital dance technologies. Students prepare a choreographic piece for the camera as a final project. Cross-listed with MCS 161.

**DNCE 162. Tool, Technology, Technique (4)** Lecture, 1 hour; practicum, 3 hours; screening, 3 hours; laboratory, 3 hours. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Practicum in video and digital production, with an

emphasis on capturing and editing the moving body. Students bring their own video or digital recording device. Editing equipment will be available. Cross-listed with MCS 162.

**DNCE 167. Dance Production (2)** Studio, 6 hours. Prerequisite(s): by audition. Study, production, and performance of dances. Course may be repeated for credit.

**DNCE 168. Dance Touring Ensemble (4)** Studio, 6 hours; outside research, 3 hours. Prerequisite(s): consent of instructor. Dance Touring Ensemble members work with the instructor to create a lecture-demonstration and create and learn repertory which is performed at various sites within the community. Course is repeatable to a maximum of 16 units.

**DNCE 171 (E-Z). Filmic Bodies (4)** For hours and prerequisites, see segment descriptions. Assesses a multiplicity of filmic genres through the portals of the dancing and mobilized body as related to race, gender, class, and other identifiers. Explores the politics of movement on film, the mechanics of making film work, and the political economy of dance on film. Dance experience is usually not required. Segments are repeatable. Cross-listed with MCS 151 (E-Z).

**DNCE 171F. Ethnographic Representation of Dance on Film: “. . . and then they danced” (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the juncture between representation and presentation in everyday dance genres on film. Explores race, class, tropes of authenticity, and ownership of cultural production through screenings, lectures, and theoretical writings. No previous dance experience required. Course is repeatable. Cross-listed with MCS 151F.

**DNCE 171G. Gender, Mechanization, and Shape (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Utilizes film, video, and texts to examine the relationship among gender, mechanization, and shape during the twentieth century. Focuses on the performing arts, industrial and technological design, and the relationship of visual culture to changing notions of gender. Course is repeatable. Cross-listed with MCS 151G.

**DNCE 171J. Spectatorship (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the nature of film studies through the eyes of the audience. Uses film, videos, and texts (in addition to outside viewing of films in cinematic locales) to formulate how viewing film constructs the viewer's subjectivity and a film's cultural context. Course is repeatable. Cross-listed with MCS 151J.

**DNCE 171K. Interruptions as Narration: Fight Scenes, Dance Sequences, and Music Videos (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the deconstruction and reconstruction of the narrative arc. Utilizes selected films to explore performance practices such as fight scenes and dance sequences. Includes screenings both in class and outside of class. Course is repeatable. Cross-listed with MCS 151K.

**DNCE 171M. Bollywood (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the vast corpus of films that constitute the genre called Bollywood. Focuses on the genre's music and dance styles. Includes weekly film screenings. No previous dance experience required. Course is repeatable. Cross-listed with MCS 151M.

**DNCE 172 (E-Z). Televisual Bodies (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes choreographic practices within television broadcast and marketing and their relation to popular culture. Also examines situational or tactical use and misuse of satellite, cablecast, and broadcast television by unintentional audiences that subsequently reconstitute themselves as communities via the programming. Focuses on video as an archival and/or choreographic tool. J. Corporations and Corporealities: Commercials, Culture, and Choreography; K. Television as Location: The Satellite Feed; M. Music Television (MTV) and Popular Culture. Segments are repeatable. Cross-listed with MCS 152 (E-Z).

**DNCE 173 (E-Z). Digitized Bodies (4)** Lecture, 3 hours; screening, 2 hours; laboratory, 1 hour. Prerequisite(s): MCS 020; upper-division standing or consent of instructor. Provides a theoretical approach to digital subjectivities, bodies in motion, products, and realities. Addresses issues of liveness, new media, mediated cultural identities, speed, transfer, telepresence, and coded and encoded sexuality within programming. Focuses primarily on the body-computer interface. J. Digital Games, Violence, and the Body; K. Virtual Subjectivity: Persona, Identity, and Body. Segments are repeatable. Cross-listed with MCS 153 (E-Z).

**DNCE 180 (E-Z). Dance Practicum (4)** Studio, 8 hours. Prerequisite(s): upper-division courses in choreography or consent of instructor in unusual situations. An investigation of dance production theories and practices. Each practicum is directed experience in a limited topic, announced in advance of the quarter given, with the name of the guest instructor if it is not taught by the staff. E. Cine Dance; F. Folk Forms; G. Advanced Choreography; H. Intermedia Movement; I. Video Dance; J. Repertory; K. Reconstruction of Dances; L. Theory of Individual Choreographers; M. Dance for Children; N. Dance in Therapy; O. Improvisation; P. Role Preparation; Q. Dance Notation; R. Pedagogy; S-Z to be announced. Each segment is repeatable to a maximum of 12 units.

**DNCE 187. Improvisation Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Presents the emergent field of improvisation studies, moving beyond traditional genre boundaries to explore improvisation as a cultural phenomenon and social practice. Draws from jazz studies, ethnomusicology, music theory, musicology, American studies, and the histories of dance, theatre, and the visual arts. Cross-listed with MUS 187.

**DNCE 190. Special Studies (1-5)** To be taken with the consent of the Chair of the Department of Dance to meet special curricular problems. Course is repeatable to a maximum of 12 units.

**DNCE 198-I. Individual Internship in Dance (1-12)** Prerequisite(s): 1) upper-division standing; 2) evidence of prior arrangement with the professional(s) involved; and 3) approval of the UCR dance faculty sponsor. Work with an appropriate professional individual or organization to gain experience and skill in the student's chosen dance-related specialty. May be repeated to a total of 16 units.

## Graduate Courses

**DNCE 240. Improvising Choreography: Scores, Structures, and Strategies (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An evaluation of the

use of the score or structure as a predetermining guide to the production of choreography. Students create choreography in ensemble, co-choreographing dances in the moment of performance and assessing immediately the efficacy of a given approach. Course is repeatable to a maximum of 8 units.

**DNCE 241. Creating the Experiment: Identifying the New (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An inquiry into what constitutes an experiment in contemporary dance, critically examining how artists bring new dance into existence. Questions the working process in originating movement, sequencing, and images for dance and assesses this process with respect to larger historical and cultural frameworks. Course is repeatable to a maximum of 8 units.

**DNCE 242. Dancing Representation: Figures, Forms, and Frames (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of the systems of representation used to create choreographic meaning. Considers the bodily codes and the cultural associations attached to distinct qualities of movement and the conventions of space, time, and narrative through which a dance achieves its meaning. Course is repeatable to a maximum of 8 units.

**DNCE 243. Collaborating in Dance Making: Materials, Methods, and Interactions (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of the function of the choreographer as principal director of the dance project. Analysis of various approaches to the making of dance works that involve distinctive forms of collaboration with artists working in allied media. Course is repeatable to a maximum of 8 units.

**DNCE 254. Political Approaches to Dance Studies (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): reading knowledge of a language other than English; working knowledge of notation; graduate standing or consent of instructor. The study of power relations reflected in and enacted by dance practice and performance. Topics include nation formation, imperialism, race, commodification, globalization, economic and class relations, gender, and political affiliation and resistance.

**DNCE 255. Historical Approaches to Dance Studies (4)** Seminar, 3 hours; studio, 2-3 hours. Prerequisite(s): reading knowledge of a language other than English; working knowledge of notation; graduate standing or consent of instructor. The study of dances past and how dance practices have changed over time. May include study of changing modes for production and reception of dance, shifting constructions of bodies and movement, theories of dance reconstruction, and conceptualizations of historical evidence.

**DNCE 257. Rhetorical Approaches to Dance Studies (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): reading knowledge of a language other than English; graduate standing or consent of instructor. The study of dance structure and of the structure of dance study. May include the analysis of narrative or representational structures in dance; narrative structures in dance writing; dance semiotics; dance philosophy; and the accuracy, reliability, and value of critical studies of dance.

**DNCE 258. Cultural Approaches to Dance Studies (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): reading knowledge of a language other than English; graduate standing or consent of instructor. The study of dance in and across cultures including cross-cultural studies of dance; multicultural approaches to dance history; ethnological, ethno-

graphic, and cultural studies approaches to dance analysis; and analysis of the different roles and functions dance plays in cultural systems.

#### **DNCE 260 (E-Z). Seminar in Dance History (4)**

Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Studies in E. Periods; F. Styles; G. National Forms; H. Individual Artists; I. Choreographies; J. Aesthetics; K. Dance Literature; L. Notation. Each segment is repeatable as its content changes.

**DNCE 264. Oral History (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Theory and practice of oral history as a research technique. Ethnographic, social history, and gender perspectives on oral history; methods for research preparation, interview procedures, transcription, editing, and legal responsibilities. Interview project and analytical paper required.

**DNCE 267. Choreographies of Writing (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An analysis of the types of relationships that may exist between dance and text. Examines the methods and strategies for translating choreographed action into a written description of that action. Students' writing is a major focus of discussions.

**DNCE 269. Laban Movement Analysis (4)** Seminar, 3 hours; outside research, 1 hour; consultation, 1 hour; individual study, 1 hour. Prerequisite(s): DNCE 120; graduate standing or consent of instructor. An advanced survey focusing on applied research concepts and theories of the Laban Movement Analysis method of observing, recording, and analyzing human body movement. Special attention is given to motif score writing, applying Effort, Shape, and Space Harmony paradigms. Course is repeatable to a maximum of 12 units.

**DNCE 280. Colloquium in Current Topics in Dance Research (2)** Colloquium, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Colloquia on current research topics in dance. Conducted by students, faculty, and visiting scholars. Students who attend all colloquium and discussion sessions, and who write weekly review papers and a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 4 units.

**DNCE 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and Department Chair. To be taken to meet special curricular problems. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for a letter grade for specialized topics pursued with close faculty supervision. Course is repeatable.

**DNCE 291. Individual Study in Coordinated Areas (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. A program of study designed to advise and assist graduate students who are preparing for written and oral qualifying examinations. Does not count toward the unit requirement for the Ph.D. degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**DNCE 292. Concurrent Analytical Studies in Dance (1-4)** Outside research, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor and Graduate Advisor. To be taken concurrently with some 100-series course, but on an individual basis. Limited to research, criticism, and written work of a graduate order commensurate with the number of units elected. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for a let-

ter grade for specialized topics pursued with close faculty supervision. Course is repeatable.

**DNCE 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor. Individualized studies in specially selected topics in Dance under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**DNCE 298-I. Individual Internship (1-4)** Internship, 3-12 hours; term paper, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Individual study or apprenticeship with an appropriate professional individual or organization to gain experience and skill in activities related to dance studies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**DNCE 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): consent of thesis or dissertation director. Research for and preparation of the thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**DNCE 301. Directed Studies in the Teaching of Dance (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An assessment of the field of dance studies as preparation for organizing and teaching general education courses. Analyzes current anthologies and other dance publications. Students create course syllabi and lesson plans and discuss a range of practical teaching issues. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

**DNCE 302. Teaching Practicum (1-4)** Lecture, 1-4 hours. Prerequisite(s): graduate standing. Supervised teaching in upper-division Dance History and lower-division Dance courses. Must be taken at least once by all teaching assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Earth Sciences

**Subject abbreviation: GEO**  
**College of Natural and Agricultural Sciences**

Richard A. Minnich, Ph.D., Chair  
Gordon Love, Ph.D., Vice Chair  
John Herring, Student Affairs Assistant  
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(951) 827-2441; [earthscience.ucr.edu](mailto:earthscience.ucr.edu)

#### **Professors**

James H. Dieterich, Ph.D.  
Mary L. Droser, Ph.D.  
Harry W. Green, II, Ph.D.  
Nigel C. Hughes, Ph.D.  
Martin J. Kennedy, Ph.D.  
Timothy W. Lyons, Ph.D.  
Richard A. Minnich, Ph.D.  
Peter M. Sadler, Ph.D.

#### **Professors Emeriti**

Shawn Biehler, Ph.D.  
Lewis H. Cohen, Ph.D.  
Wilfred A. Elders, Ph.D.  
Tien-Chang Lee, Ph.D.  
Michael A. Murphy, Ph.D.  
Stephen K. Park, Ph.D.  
Michael O. Woodburne, Ph.D.

#### **Associate Professors**

Gordon Love, Ph.D.

Michael A. McKibben, Ph.D.  
David D. Oglesby, Ph.D.  
Alan E. Williams, Ph.D.

#### **Assistant Professors**

Robert J. Allen, Ph.D.  
Gareth Funning, Ph.D.

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#### **Adjunct Professors**

Larissa F. Dobrzynetskaya, Ph.D.  
Douglas M. Morton, Ph.D.

#### **Adjunct Assistant Professors**

Elizabeth Cochran, Ph.D.  
Katherine J. Kendrick, Ph.D.  
Thomas A. Scott, Ph.D.

#### **Lecturer**

Marilyn A. Kooser, Ph.D.

## Majors

The Department of Earth Sciences offers B.S. degrees in Geology and Geophysics, and a B.A. degree in Geoscience Education. These degree programs are designed for students with a strong interest in various aspects of the Earth Sciences, and for students interested in secondary teaching with a science emphasis. The B.S. programs place substantial emphasis on fieldwork with field courses, field trips in all appropriate courses, and excursions between quarters. The B.A. degree places emphasis on the fundamentals of geoscience, with additional coursework in education.

## Academic Advising

Undergraduate advising in the Department of Earth Sciences is designed to allow close professional contact with faculty and staff. Counseling on graduation, departmental requirements and enrollment is handled by the major's professional academic advisors housed in the CNAS Undergraduate Academic Advising Center and the faculty undergraduate advisor for each major.

Each student selects a faculty mentor who counsels the student on career goals and research opportunities. The department recommends that students meet with their faculty mentor at least once each quarter to clarify career objectives and revise the program of study so it is commensurate with the developing interests and objectives of the student.

## Teaching Credential and B.A. in Geoscience Education

Teachers in the public schools in California must have a credential approved by the State Commission on Teacher Credentialing. The credential requires an undergraduate major, baccalaureate degree, and completion of a graduate credential program such as that offered by the Graduate School of Education at UCR.

Before admission and student teaching in a graduate credential program, the candidate must pass the California Basic Education Skills Test (CBEST) and demonstrate subject-matter proficiency by passing an examination. All candidates for a multiple subject credential to teach in the elementary grades must pass the Multiple Subjects, California Subject Exam for Teachers (CSET). Students are urged to start

early, preferably as freshmen, selecting courses most helpful for this career. Details and counseling on the Perpare to Teach Program, a program for the multiple subject credential, are available in the Office of Interdisciplinary Programs, 2417 Humanities and Social Sciences, (951) 827-2743. Details and counseling on other programs are available in the Department of Earth Sciences or the Graduate School of Education.

UCR does not yet have a state-approved subject matter undergraduate program for earth science majors who wish to teach at the secondary level. The Teaching Credential in Science, geoscience authorization, is required for teachers who want to teach earth science/geoscience in middle school and high school. Students who plan to get this credential must take the CSET exams in Geosciences and should make certain their academic program includes preparatory course work. The examination includes geoscience in depth and general science with introductory, college-level biology, chemistry, physics, and geoscience (geology, meteorology, oceanography, astronomy). CSET test guides are available at [www.cset.nesinc.com](http://www.cset.nesinc.com).

Further information about courses, requirements, and examinations can be obtained in orientation meetings, the CalTEACH-SMI Office (1104 Pierce Hall) and the Graduate School of Education (1124 Sproul Hall).

Earth Science students interested in a secondary school science teaching career, who intend to obtain a Teaching Credential in Science, geoscience authorization, are encouraged to pursue the B.A. degree in Geoscience Education. This degree will best prepare such students for the state credentialing examinations, but is not intended for those students who wish to become professional geologists. Students who want to have the option to become either a professional geoscientist or to teach earth science in secondary schools should pursue both the B.S. in General Geology as well as the teaching credential from the Graduate School of Education.

Students in CNAS who intend to pursue a Teaching Credential in Science, with authorization in another science, should consider pursuing a Minor in Earth Sciences.

### Geology Major

The department offers four options for the Geology major: General Geology, Geobiology, Geophysics, and Global Climate Change. Students who choose the Geology major study the structure, composition, processes, and history of the earth. In particular, the Geology major stresses features of the Earth's surface and interactions between its atmosphere, hydrosphere, biosphere, rocky crust, and interior.

**General Geology Option** Students entering the General Geology option study the nature, distribution, age, and origin of minerals, rocks, and their contained fossils, placed within a global framework of the Earth as an evolving geologic system. The option entails a broad range of

geologic training including geology, geophysics, geochemistry, and paleontology. An emphasis is also placed on fieldwork (mapping, sampling) and thoughtful analysis of geologic data (including statistical and graphical analysis with computers). Though broadly based, the option provides the student some flexibility to pursue specific geologic areas of interest at the upper-division level. Graduates of the General Geology option are qualified to pursue almost any professional career in the Earth Sciences and are well-suited to tackle graduate research at the M.S. or Ph.D. level.

**Global Climate Change Option** The Global Climate Change option offers earth science training with an emphasis on modern and ancient evidence for global climate change and the effects of such processes on the planet. Links between human activities, organismal evolution, weathering, volcanism, plate tectonics, extraterrestrial events and the history of the atmosphere and oceans are examined. Ancient earth climate trends are studied as proxies for predicting future climate change. Students in this option receive training in climatology, oceanography, paleoecology, stratigraphy, earth resources and the global carbon cycle.

**Geobiology Option** The Geobiology option offers broad-based geological training combined with a special emphasis on paleontology and organism–time interactions. Students take the geology core but at the undergraduate upper-division level focus on courses related to the fossil record, evolution and biodiversity, sedimentology, stratigraphy, and biogeography. The graduate leaves with a marketable geology degree coupled with special insight into historical aspects of life's place and role on this planet.

**Geophysics Option** The Geophysics option allows a student to combine general geological training with geophysical techniques to image the Earth's interior. Students take the geology core but complete additional courses in physics, mathematics, geophysics, and geohydrology. Emphasis is placed on applications of geophysics to hydrological, environmental, and natural resource problems. Graduates are especially suited to enter professional employment in environmental geology and resource exploration or graduate programs in Earth Sciences. Students seeking to enter graduate programs in Geophysics should pursue the Geophysics major.

### Geophysics Major

Students who choose the Geophysics major apply the principles and concepts of physics, mathematics, geology, and engineering to the study of the physical characteristics of the earth and other planets. They make measurements of gravity and magnetic fields, seismic waves, temperatures, and natural electric current. Geophysicists study these topics from the standpoint of the physics of solid bodies, gases, and fluids. Some geophysicists are field oriented, some laboratory oriented, some theoretical, and some combine these areas.

### Geoscience Education Major

Students who chose the B.A. degree in Geoscience Education intend to teach earth science and general science at the secondary school level. Students receive Freshman- and Sophomore-level training in General Geology, training in introductory Biology, and Freshman-level training in Chemistry, Calculus, and Physics. They also take courses in Education that are required for state examinations and teacher credentialing in California. The B.A. in Geoscience Education degree is designed for prospective secondary science teachers; it will not lead to a career as a professional geologist.

Students who want to have the option to become either a professional geoscientist or to teach earth science in secondary school should pursue both the B.S. in General Geology as well as the teaching credential from the Graduate School of Education.

### University Requirements

See Undergraduate Studies section.

### College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

### Major Requirements

#### Geology Major

All courses in Geosciences that are prerequisites for other courses in the major must be passed with a grade of "C-" or better before proceeding in the sequence. For example, GEO 001 is a prerequisite for GEO 122.

The department offers four options to majors in Geology: General Geology, Geobiology, Geophysics, and Global Climate Change. All students majoring in Geology are normally required to take the core curriculum.

#### General Geology, Geobiology, Geophysics, and Global Climate Change Options

##### Core Requirements (77-79 units)

1. Lower-division requirements (58-59 units)
  - a) GEO 001, GEO 002, GEO 003/  
BIOL 010
  - b) BIOL 002 or both BIOL 005A and  
BIOL 05LA
  - c) Either CHEM 001A and CHEM 01LA or  
CHEM 01HA and CHEM 1HLA, either  
CHEM 001B and CHEM 01LB or CHEM  
01HB and CHEM 01HLB, either CHEM  
001C and CHEM 01LC or CHEM 01HC  
and CHEM 1HLC
  - d) MATH 008B or MATH 009A,  
MATH 009B, MATH 009C
  - e) PHYS 040A, PHYS 040B, PHYS 040C

2. Upper-division requirements (19-20 units)
  - a) GEO 101, GEO 115, GEO 122
  - b) STAT 100A or STAT 155

**Global Climate Change Option** (59 units)

1. Lower-division requirements (20 units)
  - a) BIOL 005B, BIOL 005C
  - b) GEO 009, GEO 010 and GEO 011
2. Upper-division requirements (39 units)
  - a) GEO 118, GEO 136 or GEO 137, GEO 152 or GEO 153, GEO 157, GEO 160, GEO 169
  - b) Fourteen (14) units of related upper-division course approved by the under-graduate advisor

**General Geology Option** (58 units)

1. GEO 100, GEO 116, GEO 118, GEO 123
2. GEO 102A (14 units in one quarter), or GEO 102A and GEO 102B (14 units in two quarters), or GEO 102A, GEO 102B, and GEO 102C (14 units in three quarters).
3. One course from GEO 157, GEO 160, GEO 161, GEO 162, GEO 169
4. One course from GEO 124, GEO 132, GEO 136, GEO 137
5. One course from GEO 140, GEO 144, GEO 145, GEO 147.
6. GEO 151 or GEO 152/BIOL 152
7. Eight (8) additional units of related upper-division courses approved by the under-graduate advisor

**Geobiology Option** (58 units)

1. BIOL 005B, BIOL 005C
2. GEO 100, GEO 116, GEO 118, GEO 123
3. GEO 102A (14 units in one quarter), or GEO 102A and GEO 102B (14 units in two quarters), or GEO 102A, GEO 102B, and GEO 102C (14 units in three quarters).
4. Three courses from GEO 151, GEO 152/BIOL 152, GEO 160, GEO 169
5. Four (4) additional units of related upper-division courses approved by the under-graduate advisor

**Geophysics Option** (55 units)

1. MATH 046
2. PHYS 040D, PHYS 040E
3. GEO 116, GEO 118, GEO 132, GEO 140, GEO 144, and GEO 145 or GEO 147
4. Two additional 4-unit upper-division courses in Geosciences
5. Two upper-division physical science courses approved by the undergraduate advisor

**Geophysics Major**

The following are major requirements for the B.S. in Geophysics. All students majoring in Geophysics are normally required to take this core curriculum.

1. Lower-division requirements (67-68 units)

- a) Either CHEM 001A and CHEM 01LA or CHEM 01HA and CHEM 1HLA, either CHEM 001B and CHEM 01LB or CHEM 01HB and CHEM 01HLB, either CHEM 001C and CHEM 01LC or CHEM 01HC and CHEM 1HLC

- b) GEO 001

- c) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046

- d) PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D

- e) CS 010

2. Upper-division requirements (61-66)

- a) GEO 115, GEO 116, GEO 140, GEO 145

- b) Two of GEO 100, GEO 122, GEO 123, GEO 132, GEO 137, GEO 144, GEO 147, GEO 157

- c) Five of PHYS 130A, PHYS 130B, PHYS 134, PHYS 135A, PHYS 135B, PHYS 136, PHYS 139L, PHYS 142L, PHYS 177, MATH 113, MATH 131, MATH 132, MATH 135A, MATH 135B, MATH 146A, MATH 146B, MATH 147

- d) Sixteen (16) units of upper-division physical science courses, which may include up to 9 units of Senior Thesis (GEO 195A, GEO 195B, GEO 195C) or up to 4 units of independent internship (GEO 198-I).

**Geoscience Education Major**

The following are major requirements for the B.A. in Geoscience Education. All students majoring in Geoscience Education are normally required to take this core curriculum.

1. Lower-division Geoscience requirements (20 units)

- a. GEO 001, GEO 002, GEO 003/BIOL 010, GEO 004, GEO 010

2. Upper-division Geoscience requirements (26-30 units)

- a. GEO 115, GEO 122

- b. Four courses from: GEO 100, GEO 101, GEO 116, GEO 118, GEO 123, GEO 124, GEO 132, GEO 136, GEO 137, GEO 140, GEO 147, GEO 151, GEO 152/BIOL 152, GEO 157, GEO 160, GEO 168, GEO 169.

3. Mathematics requirements (12 units)

- a. MATH 009A, MATH 009B, MATH 009C

4. Natural Sciences requirements (28-31 units)

- a. BIOL 002, or BIOL 005A and BIOL 05LA

- b. CHEM 001A and CHEM 01LA, CHEM 001B and CHEM 01LB, CHEM 001C and CHEM 01LC

- c. PHYS 002A and PHYS 002B and PHYS 002C, or PHYS 040A and PHYS 040B and PHYS 040C

5. Humanities requirements (to count towards College requirement of 20 units for the B.A.)

- a. LING 020 or LING 021

6. Education requirements (41 units):

- a. EDUC 003, EDUC 004, EDUC 100B or equivalent, EDUC 104/MATH 104, EDUC 109, EDUC 110, EDUC 116, EDUC 139, EDUC 174, EDUC 177A

**Minor**

Students who wish to Minor in Geology, Geophysics or Global Climate Change must complete 20-28 units of organized upper division courses in Geosciences. A minimum of 16 of these units must be unique to the minor and cannot be used to satisfy major requirements. To satisfy prerequisites, additional preparatory coursework in Earth Sciences and other sciences (Biology, Chemistry, Mathematics, Physics) may be required.

**Minor in Geology:** GEO 001, GEO 115; plus 15-23 additional upper division Geosciences units.

**Minor in Geophysics:** GEO 001; GEO 140; plus 16-24 additional units taken from GEO 115, GEO 116, GEO 132, GEO 144, GEO 145, GEO 190, and GEO 199.

**Minor in Global Climate Change:** GEO 001 or GEO 002; GEO 011; GEO 160; plus 16-24 additional upper division Geoscience units.

Before submitting a petition for a Minor to the college, students interested in pursuing a Minor in Geology or Geophysics or Global Climate Change must consult with the undergraduate faculty advisor in Earth Sciences.

**Graduate Programs**

The department of Earth Sciences offers the M.S. and Ph.D. in Geological Sciences.

Graduate education in the Geological Sciences emphasizes general geology combined with specialization in fields such as evolutionary paleobiology, invertebrate and vertebrate paleontology, Quaternary geology, neotectonics, applied geophysics, geotectonics, crustal processes, geochemistry, groundwater, mineral deposits, stratigraphy, sedimentology, sedimentary geochemistry, basin analysis, landscape ecology, fire ecology, and natural resource conservation. Integrated field and laboratory studies are encouraged.

**Admission** An undergraduate degree in geology or geophysics is the normal preparation for graduate work; however, a degree from a related field of science or engineering is often appropriate. Applicants to graduate status must supply GRE General Test (verbal, quantitative, analytical) scores before admission.

**Master's Degree**

In addition to the general requirements listed under the Graduate Studies section of this

catalog, the requirements for the M.S. degree in Geological Sciences, under the Plan 1 (Thesis), are as follows.

**Admission** Students must make up any deficiency in preparation. The background required is course preparation equivalent to the bachelor's degree in Geology or Geophysics at UCR. Courses taken to remedy background deficiencies are not applicable to the graduate degree. Such courses are designated in the letter of admission to the program sent by the dean of the Graduate Division to the student.

**Biannual Reviews** All students must undergo biannual reviews by the departmental Graduate Progress Committee. A student's progress is assessed in these reviews, and the committee may recommend changes in a student's plans after these reviews.

**Course Work** All students must enroll each quarter in the Graduate Seminar in Geosciences (GEO 250). Students must attend the weekly Hewett Club lecture series.

Students must complete a minimum of 36 units of course work in the major and related subjects and obtain advance approval of a coherent plan of study from the graduate advisor.

A maximum of 12 upper-division units beyond the requirements for the bachelor's degree may be applied to the 36-unit requirement.

Students must complete a minimum of 12 units of graduate courses, which must include at least four graduate-level instructional courses taught by four different faculty members as approved by the graduate advisor.

Subject to the approval of the graduate advisor, a limited number of upper-division courses in the major and related sciences, if not required for the bachelor's degree and not taken previously, may be accepted for graduate credit.

**Thesis and Final Oral Examination** Before the end of the third quarter of study and before embarking on research, the student must submit a written thesis proposal to the graduate progress committee. After approval of the proposal, the student must submit a thesis based on original work for approval by a thesis committee. A maximum of 12 units of thesis research may be counted toward the 36-unit minimum.

Students present an open research seminar as a final oral examination, which is advertised to all the students and faculty in the Earth Sciences Department.

**Normative Time to Degree** 7 quarters

#### Global Climate and Environmental Change

**(GCEC)** The GCEC MS track is a field and laboratory based multidisciplinary program focused on the evidence for and controls of past and present climate change. Candidates must complete the following:

**Course Work** Students must complete a minimum of 36 quarter units of graduate and upper-division undergraduate courses, and research credit from 1 and 2 (below). Other

upper-division undergraduate and graduate classes outside may be substituted with consent of the Graduate Advisor. 24 of 36 credits must be graduate level.

- 1) Required Core courses: GEO 224 upon entry into the program, GEO 260 and BIOL 212/ENTM 212/GEO 212.
- 2) At least two additional disciplinary courses: GEO 221, GEO 226, GEO 239, GEO 249, GEO 251, GEO 255, GEO 264, GEO 265, GEO 268, GEO 301, OR ENSC 200, ENSC 218, ENSC 224, ENSC 225, ENSC 232.

**Thesis Work** Before the end of the third quarter students must nominate a faculty advisor and identify a thesis topic. Before embarking on research the student must submit a thesis proposal based on original work for approval by a thesis committee. A maximum of 8 units of research credit can be counted toward the 36 unit minimum. Students present an open research seminar as a final oral examination.

## Doctoral Degree

The Department of Earth Sciences offers the Ph.D. in Geological Sciences. In addition to the general university requirements of the Graduate Division as found in the Graduate Studies section of this catalog, the Ph.D. in Geological Sciences normally requires the following.

**Biannual Reviews** All students meet with the Graduate Progress Committee during their first week at UCR to discuss general interests, goals, and plans. The committee recommends courses designed to prepare a student for research and to correct deficiencies in background. This committee also reviews a student's progress biannually and may recommend transfer to the master's program if normal progress is not maintained.

**Course Work** Students must complete at least four graduate-level instructional courses taught by four different faculty members as approved by the graduate advisor. Course work used in satisfaction of the M.S. degree may be accepted with the graduate advisor's approval. All students must enroll each quarter in the Graduate Seminar in Geosciences (GEO 250). Students are also required to attend the weekly Hewett Club lecture series.

#### Written and Oral Qualifying Examinations

Students must write two research proposals. The proposal topics must be approved by an examination committee to ensure breadth. The committee reviews the proposals and, if acceptable, recommends proceeding to the oral qualifying examination. An oral examination committee appointed by the dean of the Graduate Division examines the adequacy of the student's preparation to conduct the proposed research. Advancement to candidacy in the Ph.D. program follows successful completion of the oral examination.

**Dissertation and Final Oral Examination** A dissertation normally evolves from one of the research proposals. The dissertation must present origi-

nal scholarly work and be approved by a dissertation committee before the student may take the final oral examination. Students must have satisfactory performance on the final oral examination given by the dissertation committee. Major emphasis in this examination is on the dissertation and related topics.

**Normative Time to Degree from the B.S.** 17 quarters

## Lower-Division Courses

**GEO 001. The Earth's Crust and Interior (4)** Lecture, 3 hours; laboratory, 3 hours; one 1-day field trip. An introduction to the physical development of the Earth. Emphasis will be on Earth materials (rocks and minerals), processes (weathering, erosion, mountain building), structures (folds and faults), and current theories regarding the Earth's crust and interior.

**GEO 002. Earth's Climate through Time (4)** Lecture, 3 hours; laboratory, 3 hours; one 2-day field trip. Prerequisite(s): none. An introduction to the history of Earth's changing climate and its relationship to the evolution of life on human to geologic time scales. Topics include the interrelationships among short- and long-term carbon cycling; plate tectonics; ocean and atmosphere circulation; and greenhouse gases through time.

**GEO 003. Headlines in the History of Life (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. Evolution of life beginning with precellular life. Topics include the origin of sex, multicellularity, vertebrate classes, morphological specializations, adaptive radiations, extinction dynamics, and the biology of dinosaurs. Cross-listed with BIOL 010.

**GEO 004. Natural Hazards and Disasters (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENGL 001A or equivalent (may be taken concurrently). Application of basic principles of climate and geology to recognition of natural hazards and their mitigation. Topics include fires, freezes, floods, winds, landslides, volcanic eruptions, earthquakes and tsunamis. Emphasis is on confronting hazards of concern to home-buyers, planners, and conservationists in the western United States, especially southern California.

**GEO 005. Our Family of Planets (4)** Lecture, 3 hours; discussion, 1 hour. An introduction to the comparative study of planets, moons and other solar system objects. Explores the physical, chemical and nuclear evolution of the cosmos, stars and solar systems. Addresses similarities and differences in appearances, orbital motions, compositions, conditions and histories of global change on planets and moons, including extra solar planets and life.

**GEO 006. The Violent Universe (4)** Lecture, 3 hours; discussion, 1 hour. An introduction to violent phenomena that power the universe, specifically phenomena that illustrate basic astrophysical principles. Topics include impacts in our planetary system: explosions of stars, bursts of star formation, galaxy collisions, black holes, quasars, cosmic jets, and the "Big Bang." Cross-listed with PHYS 006.

**GEO 007. Minerals and Human Health (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introductory overview of the role of minerals in human life and industrial activities. Topics include the impact of minerals on human health, the role of minerals in modern technologies, asbestos and silica problems, occupational diseases caused by inhalation of mineral dust, and environmental protection in California. May include a field trip.

**GEO 008. Earthquake Country (4)** Lecture, 3 hours; discussion, 1 hour. An introduction to the study of earthquakes and the problems of living in earthquake country. Why earthquakes occur, how they are recorded, and what the effects are on man and his structures. The scientific and social consequences of earthquake prediction.

**GEO 009. Oceanography (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A general introduction to the geological, physical, chemical, and biological processes related to the characteristics and evolution of the ocean system. Explores the role oceans play in regulating climate and the cycling of elements on the Earth's surface. Illustrates how the ocean system has been, and continues to be, one of the most important influences on life. Credit is awarded for only one of GEO 009 or GEO 009H.

**GEO 009H. Honors Oceanography (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to GEO 009. A general introduction to the geological, physical, chemical, and biological processes related to the characteristics and evolution of the ocean system. Explores the role oceans play in regulating climate and the cycling of elements on the Earth's surface. Illustrates how the ocean system has been, and continues to be, one of the most important influences on life. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of GEO 009 or GEO 009H.

**GEO 010. Earth Resources and Sustainability (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the occurrence, availability, marketing, and usage of metals, minerals, fossil fuels, nuclear fuels and other geologic resources, including both historic and recent trends. Addresses conflicts between modern society's need for increasingly scarce resources and mounting environmental problems. Also covers achieving sustainability through conservation, recycling, and substitution.

**GEO 011. Global Climate Change (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Application of the scientific method to the global climate change debate. Provides an understanding of Earth's feedback systems that regulate the climate over long- and short-term time scales. Includes oceanic and atmospheric circulation patterns, the major reservoirs and global carbon cycle, and the influence and origin of greenhouse gases. Credit is awarded for only one of GEO 011 or GEO 011H.

**GEO 011H. Honors Global Climate Change (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to GEO 011. Application of the scientific method to the global climate change debate. Provides an understanding of Earth's feedback systems that regulate the climate over long- and short-term time scales. Includes oceanic and atmospheric circulation patterns, the major reservoirs and global carbon cycle, and the influence and origin of greenhouse gases. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of GEO 011 or GEO 011H.

**GEO 012. At Home in the Universe (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Considers the place of humans in space and time and the means by which this is discerned. Presents a synopsis of the history of the cosmos, Earth, life, and humanity from a science-based perspective. Discuss the implications of such knowledge for how responsible individuals choose to conduct themselves.

**GEO 050. Survey of Geoscience for Science Teachers (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): both CHEM 001A and CHEM 011A or both CHEM 011A and CHEM 1H1A; PHYS 002A or PHYS 040A. Prepares teachers of comprehensive courses in general science to integrate the geoscience component. Reviews fundamental concepts of geology, oceanography, and meteorology at the foundational level of the California Subject Examinations for Teachers in physical science. Emphasizes commonalities between related sciences.

## Upper-Division Courses

**GEO 100. Igneous and Metamorphic Petrology (5)** Lecture, 3 hours; laboratory, 6 hours; four field trips. Prerequisite(s): GEO 115 and GEO 123 with grades of "C-" or better. An introduction to the nomenclature and classification of igneous and metamorphic rocks. Includes identification of the major rock-forming minerals and common rocks in hand samples and thin sections, as well as interpretation of rock fabrics and textures. Explores tectonic setting and the origins of major rock types.

**GEO 101. Field Geology (5)** Lecture, 2 hours; weekly 1-day field trips. Prerequisite(s): GEO 115 with a grade of "C-" or better or consent of instructor for concurrent enrollment. Introductory course in field geology. Covers methods of mapping igneous, metamorphic, and sedimentary rocks. Includes construction of planimetric and topographic maps, use of aerial photographs, and instruction in basic surveying techniques.

**GEO 102A. Summer Field Geology (1-14)** field, 30-420 hours per quarter. Prerequisite(s): GEO 100 and GEO 118 with grades of "C-" or better or consent of instructor. Covers geological mapping and interpretation, as well as writing of geological reports. May be undertaken as a one-, two-, or three-quarter course (GEO 102A, GEO 102B, GEO 102C). Total credit awarded for GEO 102A plus GEO 102B plus GEO 102C may not exceed 14 units. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned.

**GEO 102B. Summer Field Geology (1-14)** field, 30-420 hours per quarter. Prerequisite(s): GEO 102A. Covers geological mapping and interpretation, as well as writing of geological reports. May be undertaken as a one-, two-, or three-quarter course (GEO 102A, GEO 102B, GEO 102C). Total credit awarded for GEO 102A plus GEO 102B plus GEO 102C may not exceed 14 units. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned.

**GEO 102C. Summer Field Geology (1-14)** field, 30-420 hours per quarter. Prerequisite(s): GEO 102B. Covers geological mapping and interpretation, as well as writing of geological reports. May be undertaken as a one-, two-, or three-quarter course (GEO 102A, GEO 102B, GEO 102C). Total credit awarded for GEO 102A plus GEO 102B plus GEO 102C may not exceed 14 units. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned.

**GEO 115. Geologic Maps and Landforms (5)** Lecture, 2 hours; laboratory, 6 hours; field, 30 hours per quarter. Prerequisite(s): GEO 001 (may be taken concurrently); MATH 004 or MATH 005, or MATH 008A. Examines characteristic patterns of bedrock outcrops, surficial deposits, the related landforms, and their representation on maps. Covers unconformities, folds, faults, intrusions, alluvial fans, river terraces, and landforms indicative of glaciers, volcanoes, landslides, and earthquakes. Applies map information to resource and hazard evaluation.

**GEO 116. Structural Geology (5)** Lecture, 2 hours; laboratory, 6 hours; three half-day and two 1-day field trips. Prerequisite(s): GEO 115 with a grade of "C-" or better; PHYS 040A; or consent of instructor. Examines geological structures in the field. Covers the graphical solution of structural problems and laboratory map study, the genesis of rock structures, the physics of rock deformation, and Mohr diagrams and elementary stress analysis.

**GEO 118. Sedimentology and Stratigraphy (5)** Lecture, 2 hours; laboratory, 6 hours; two 1-day and one 2-day field trips. Prerequisite(s): GEO 115 with a grade of "C-" or better. A study of the principles of sedimentology and the comparative study of the origins of sediments and sedimentary rocks from various modern and ancient clastic, carbonate, and mixed siliciclastic-carbonate depositional environments. Emphasizes field and stratigraphic relationships, as well as petrographic and hand specimen identification.

**GEO 122. Introductory Mineralogy (5)** Lecture, 3 hours; laboratory, 5 hours; two half-day and one 1-day field trips. Prerequisite(s): both CHEM 001B and CHEM 011B or both CHEM 011B and CHEM 1H1B (CHEM 001B, CHEM 011B, CHEM 011B, and CHEM 1H1B may be taken concurrently); GEO 001 with a grade of "C-" or better. A study of common and important minerals and their identification using structural and crystallographic methods. Stresses distinctive structural and chemical features, diagnostic physical and optical properties, and the growth and development of minerals in various geologic environments.

**GEO 123. Analytical Mineralogy (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): both CHEM 001C and CHEM 011C or both CHEM 011C and CHEM 1H1C; GEO 122 with a grade of "C-" or better. Advanced techniques in mineralogy. Covers optical crystallography, with an introduction to X-ray diffraction, electron microscopy, and other analytical techniques.

**GEO 124. Advanced Petrogenesis (4)** Lecture, 2 hours; laboratory, 6 hours; two 1-day field trips. Prerequisite(s): GEO 100 with a grade of "C-" or better. Explores advanced topics in the petrogenesis of igneous and metamorphic rocks in the Earth's crust and mantle. Examines field and structural relationships of crystalline rocks and how thermodynamics, experimental phase equilibria, and computer modeling are used to study petrogenesis. Each student completes a field and laboratory research project and prepares a written and oral report on the project.

**GEO 132. Groundwater Geology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): both CHEM 001B and CHEM 011B or both CHEM 011B and CHEM 1H1B; MATH 009B or MATH 09HB; PHYS 040A. Covers the nature and behavior of waters in geologic media; including the chemical nature of groundwaters and geothermal fluids; principles of fluid flow in sediments and rocks; chemical reactions between solutes and geologic media; geologic aspects of contaminant migration in groundwaters; behavior of geothermal fluids; elementary computer modeling of groundwater and geothermal fluid flow in geologic media.

**GEO 136. Introduction to Molecular and Petroleum Geochemistry (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): both CHEM 001C and CHEM 011C or both CHEM 011C and CHEM 1H1C or equivalents; GEO 001 with a grade of "C-" or better or GEO 002 with a grade of "C-" or better. Explores the global carbon cycle and the origin and fate of organic carbon molecules throughout Earth's history. Covers production and composition of biogenic matter and microbial, chemical and thermal processing of sedimentary organic matter, leading to oil, gas and coal formation.

Addresses important applications to the petroleum and environmental sectors.

**GEO 137. Geochemistry of Natural Waters (4)** Lecture, 3 hours; laboratory, 30 hours per quarter. Prerequisite(s): both CHEM 001C and CHEM 011C or both CHEM 01HC and CHEM 1HLC or equivalents; GEO 001 with a grade of "C-" or better or GEO 002 with a grade of "C-" or better. Examines the chemical principles of natural geologic processes occurring at and near Earth's surface. Topics include biogeochemical cycles of the elements; water-rock interactions; applications of thermodynamics and kinetics to the study of low-temperature processes and their rates; and proxy records of Earth history examined in the field and lab.

**GEO 138. Soils of Natural Ecosystems and Landforms (4)** Lecture, 3 hours; laboratory, 4 hours per quarter; one half-day field trip and three 1-day field trips. Prerequisite(s): ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; GEO 001 or GEO 002; or consent of instructor. Study of soils in diverse natural environments. Examines how soils form and their roles in ecosystem function and landscape processes. Includes causes of soil variability, fundamentals of soil classification, and indicators of current and past environmental conditions. Field trips emphasize the description and interpretation of soils. Cross-listed with ENSC 138 and SWSC 138.

**GEO 140. Global Geophysics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 001 with a grade of "C-" or better; MATH 009C or MATH 09HC; PHYS 040C; or consent of instructor. Introduces central concepts of solid earth geophysics as applied at the global or planetary scale. Includes plate tectonics and dynamics of the lithosphere; seismology and earth structure; geothermal behavior and heat flow; and geodynamics and planetary geophysics.

**GEO 144. Earthquake Seismology (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 010A, MATH 010B, MATH 046, PHYS 040A, PHYS 040B, PHYS 040C; or consent of instructor. Introduction to the theories and observations of earthquake seismology. Students use physical principles and mathematical techniques to study the earthquake process, wave propagation, and ground motion. The laboratory emphasizes computer-assisted analysis of various types of seismic data, as well as simple modeling techniques.

**GEO 145. Applied and Exploration Geophysics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 001 with a grade of "C-" or better; MATH 009B or MATH 09HB; PHYS 002C or PHYS 040C; or consent of instructor. Introduces applied geophysical methods used to explore and characterize the shallow subsurface. Topics include gravity, magnetism, seismic reflection and refraction, electrical resistivity, electromagnetism, and ground penetrating radar. Explores techniques to solve problems related to groundwater, as well as environmental, mineral, and petroleum exploration and engineering issues. Requires a week-end field trip.

**GEO 147. Active Tectonics and Remote Sensing (4)** Lecture, 2 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): GEO 001, GEO 115; or consent of instructor. A computer-based course that introduces active tectonics and the earthquake cycle and how they are studied using remote sensing data. Explores examples of actively deforming areas from around the world using computer visualization software and freely available data sources (satellite imagery, digital topography, GPS and earthquake data).

**GEO 151. Principles of Paleontology (4)** Lecture, 3 hours; laboratory, 3 hours; one 1-day field trip. Prerequisite(s): BIOL 010/GEO 003 with a grade of "C-" or better or BIOL 005C. Emphasis is on understanding fossils as living organisms. Topics include fundamentals of evolution and the fossil record, introductory morphometrics and biosystemic theory, functional morphology, and metazoan organization and classification.

**GEO 152. Principles of Invertebrate Paleobiology and Paleocology (4)** Lecture, 2 hours; laboratory, 3 hours; three 1-day field trips. Prerequisite(s): BIOL 005C with a grade of "C-" or better or BIOL 010/GEO 003 with a grade of "C-" or better. Topics include evolution and the fossil record, paleoecology, classification theory; the nature of adaptive radiations, and extinctions. Cross-listed with BIOL 152.

**GEO 153. Biodiversity through Time (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 010/GEO 003 with a grade of "C-" or better or BIOL 005C. Focuses on the history of biodiversity and the responses of organisms to episodes of profound environmental change. Outlines the major features of evolutionary history chronicled by fossils, the dynamics of evolutionary radiations and extinctions, and the implications of paleontological data for current issues in biodiversity.

**GEO 157. Introduction to Geographical Information Science (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing. Introduces the fundamental theory and application of geographical information science. Topics include geographic information systems, data structures, databases, and spatial data models. Explores various spatial data, including their coordinate systems, data acquisition, and associated errors. Introduces data analysis methods within geographical information systems.

**GEO 160. Global Climate Change (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor; PHYS 002B or PHYS 040B recommended. Surveys historical and paleoclimate change using basic principles on gas laws, radiant energy exchange, atmospheric circulation and oceanography, and proxy data. Topics include variability in modern climate, greenhouse gases, global warming, El Niño, Pacific decadal oscillation, ozone hole, volcanism, ice age climate, and Milankovitch cycles. Also covers stable isotope profiles, plate tectonics, greenhouse climates, paleovegetation, modern species diversity, and snowball Earth.

**GEO 161. Quaternary Paleoenvironmental Change (4)** Lecture, 2 hours; laboratory, 2 hours; two 2-day field trips. Prerequisite(s): GEO 001 with a grade of "C-" or better or GEO 002 with a grade of "C-" or better. Examines geological evidence of environmental change throughout Quaternary times ("Ice Age") to provide a framework for understanding natural environmental change and for predicting future change.

**GEO 162. Geomorphology (4)** Lecture, 2 hours; laboratory, 6 hours; one 2-day field trip. Prerequisite(s): upper-division standing or consent of instructor. A study of surficial processes related to the development and evolution of landforms and landscapes at the Earth's surface. Emphasis is on weathering regimes, mass wasting and hillslope development, river process, and form. Examines erosional and depositional processes in tectonic, volcanic, arid, karst, glacial, and coastal landscapes.

**GEO 167. Conservation Biogeography (4)** Lecture, 3 hours; laboratory and field, 3 hours. Prerequisite(s): BIOL 005C with a grade of "C-" or better or BIOL 010/GEO 003 with a grade of "C-" or better. Application of biogeographic and ecological theories in

the conservation of plants, animals, and wildlands. Topics include biological preserve design, ecological consequences of land development, and wildlife-habitat relationships.

**GEO 169. California Vegetation (4)** Lecture, 3 hours; laboratory, 3 hours; two 1-day field trips. Prerequisite(s): BIOL 005C with a grade of "C-" or better or BIOL 010/GEO 003 with a grade of "C-" or better. Survey of the flora, distribution, and ecology of California ecosystems, including Mediterranean shrubland, conifer forests, desert scrub, valley forbfields, and exotic grasslands. Discusses vegetation in relation to climate, physiography, fire, landscape steady states, biological invasions, paleobotany, and broad-scale change due to land development, invasive species, grazing, and fire suppression.

**GEO 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing; consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

**GEO 191. Undergraduate Seminar in Geological Sciences (1)** Seminar, 1 hour. Prerequisite(s): open to upper division Geological Sciences majors only. For undergraduate students who desire formal participation in the weekly departmental seminar. In addition to attending the seminar, students must write abstracts describing two of the presentations. Graded Satisfactory (S) or No Credit (NC). May be repeated to a total of 6 units.

**GEO 195A. Senior Thesis (3-5)** hours per week to be established by supervisor. Prerequisite(s): senior status; consent of instructor. Preparation of a thesis based upon supervised field and/or laboratory research and literature review in the geological sciences. The thesis may be undertaken as a one-, two-, or three-quarter sequence. In the case of a two- or three-quarter sequence, the final grade will be deferred until completion of the last quarter. Total credits for GEO 195A, GEO 195B, and GEO 195C may not exceed 9 units.

**GEO 195B. Senior Thesis (3-5)** hours per week to be established by supervisor. Prerequisite(s): senior status; consent of instructor. Preparation of a thesis based upon supervised field and/or laboratory research and literature review in the geological sciences. The thesis may be undertaken as a one-, two-, or three-quarter sequence. In the case of a two- or three-quarter sequence, the final grade will be deferred until completion of the last quarter. Total credits for GEO 195A, GEO 195B, and GEO 195C may not exceed 9 units.

**GEO 195C. Senior Thesis (3-5)** Prerequisite(s): senior status; consent of instructor. Preparation of a thesis based upon supervised field and/or laboratory research and literature review in the geological sciences. The thesis may be undertaken as a one-, two-, or three-quarter sequence. In the case of a two- or three-quarter sequence, the final grade will be deferred until completion of the last quarter. Total credits for GEO 195A, GEO 195B, and GEO 195C may not exceed 9 units.

**GEO 198-I. Independent Internship (1-12)** Field, 3-36 hours. Prerequisite(s): consent of instructor, undergraduate advisor, and department chairman. Independent study in a surrogate job condition under non-university supervision. Internships are normally in public or private institutions such as planning departments, research labs, or industry. Position, task, method of reporting completion and accomplishments, and units must have prior agreement among student, instructor, and supervisor. One unit for every

three hours per week spent in internship. Graded Satisfactory (S) or No Credit (NC).

## Graduate Courses

**GEO 201A. Research and Proposal Design (2)** Seminar, 1 hour; written work, 3 hours. Prerequisite(s): graduate standing. Teaches the fundamentals of research topic selection and development of hypotheses. Addresses presentation techniques and design of research projects, experiments, and field campaigns. Includes preparation and discussion of small grant proposals, as well as short oral presentations related to applicable areas of study. Graded Satisfactory (S) or No Credit (NC).

**GEO 201B. Proposal Writing and Review (2)** Seminar, 1 hour; written work, 3 hours. Prerequisite(s): graduate standing, GEO 201A; or consent of instructor. Covers the writing and review processes for major grant proposals. Includes the preparation, review, ranking, and summarizing of full-length federal grant proposals in accordance with federal panel guidelines. Graded Satisfactory (S) or No Credit (NC).

**GEO 203. Mineral Equilibria (4)** Lecture, 4 hours. Prerequisite(s): GEO 137 or consent of instructor. Applications of thermodynamics and kinetics to evaluating equilibria among minerals and fluids in geological environments. Emphasis placed on equilibria in geothermal systems, ore deposits, metamorphic and igneous rock, and groundwater.

**GEO 205. Geohydrology (4)** Lecture, 3 hours; laboratory, 3 hours; one 1-day field trip. Prerequisite(s): GEO 132 or ENSC 163. Fluid flow in geologic media; resource evaluation; and relevant geologic hazards and geotechnical problems.

**GEO 206A. Stratigraphy (4)** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 118; consent of instructor. Covers rock stratigraphy and time stratigraphy with an emphasis on their principles, history, and methods. Includes reading and analysis of pertinent literature and field trips.

**GEO 206B. Stratigraphy (4)** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 118; consent of instructor. Covers time stratigraphy and biostratigraphy with an emphasis on their principles, history, and methods. Includes reading and analysis of pertinent literature and field trips.

**GEO 212. Ecological Systems in Space and Time (4)** Lecture, 3 hours; field, 30 hours per quarter. Prerequisite(s): BIOL 117 or BIOL 152/GEO 152 or equivalent or consent of instructor. Focuses on how ecological systems are interpreted and reconciled at the community, landscape, and paleontological scales. Addresses the role of extrinsic factors operating at each of these scales. Also examines the historical development of our understanding of ecological systems at various scales. Cross-listed with EEOB 212 and ENTM 212.

**GEO 219. Theory of Systematics (4)** Lecture, 4 hours. Prerequisite(s): BIOL 112/BPSC 112/ENTM 112 or equivalent or consent of instructor. Examines topics developed around a series of classical and recent papers on the principles, philosophy, and methodology of modern systematics and phylogenetic methods. Cross-listed with EEOB 219 and ENTM 219.

**GEO 221. Electron Microscopy and Microanalysis (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to electron microscopy and microanalysis of inorganic solids including minerals and synthetic materials. Students learn the physical principles, strengths, and limitations of the method. Laboratory

provides hands-on experience with scanning and transmission electron microscopes and interpretation of images and data.

**GEO 223. Seminar in Geobiology (1)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Lectures, discussions and demonstrations by students, faculty and invited scholars on current research topics in Geobiology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GEO 224. Sierran Studies: The Paleoclimate Record of the Sierra (4)** Field, 90 hours per quarter; term paper, 3 hours. Prerequisite(s): graduate standing. A study of climate change in the Sierra Nevada Mountains, extending from Precambrian glacial sediments to modern glaciers. Utilizes field evidence to access the controls of climate and determine the resolution and limitations of the physical record. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topics change to a maximum of 8 units.

**GEO 225A. Geology of Carbonate Rocks (4)** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 118; consent of instructor. Covers characterization, recognition, and interpretation of carbonate rocks. Laboratory work includes study of polished and thin sections of selected suites of rocks.

**GEO 225B. Geology of Detrital Rocks (4)** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 118; consent of instructor. Covers characterization, recognition, and interpretation of detrital rocks. Laboratory work includes study of polished and thin sections of selected suites of rocks.

**GEO 226. Soil Geomorphology (4)** Lecture, 2 hours; laboratory, 6 hours; two Saturday field trips per quarter. Prerequisite(s): ENSC 138/GEO 138/SWSC 138, GEO 162, or equivalents. Examines the interaction of pedogenic and geomorphic processes during the Quaternary, with an emphasis on the rate of these processes. Group research includes field data collection and analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with SWSC 226.

**GEO 239. Advanced Topics in Resource Geology (4)** Seminar, 4 hours. Prerequisite(s): GEO 100; consent of instructor. Covers topics in nonrenewable mineral and energy resources, such as petroleum resources; nuclear energy and waste disposal; toxic metals and groundwater contamination; and coal resources and global warming. Discusses geologic and environmental aspects of these resource issues. Content may vary from year to year. Requires oral and written research reports. Course is repeatable to a maximum of 8 units.

**GEO 240. Seminar in Earthquake Processes and Geophysics (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores selected contemporary topics in the areas of earthquake and fault processes, geophysics, active tectonics, and seismology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**GEO 241. Advanced Field Geophysics (14)** Lecture, 10 hours; laboratory, 16 hours; field, 14 hours. Prerequisite(s): GEO 140; proficiency in a word processing, spread sheet, or programming language. Advanced applications of modern geophysical field techniques to the solution of complex geological problems, using seismic refraction and reflection, electrical and electromagnetic, potential field, and well-logging methods.

**GEO 242. Numerical Methods and Modeling in the Geosciences (4)** Lecture, 3 hours; laboratory, 3 hours; outside research, 3 hours. Prerequisite(s): graduate

standing or consent of instructor. Covers numerical computing methods and their application to problems of geological and geophysical interest. Methods include linear least-squares, matrix factorization, decomposition and inversion, nonlinear optimization, and Monte Carlo analysis and data visualization and their implementation in the MATLAB language. Applications include time series analysis, seismic tomography, and geodetic data inversion. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**GEO 243A. Earthquake Physics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 144, MATH 010B, PHYS 40C, basic computer programming experience; or consent of instructor. MATH 046 is recommended. An exploration of the physics of the earthquake process. Focuses on processes controlling fault slip and friction mechanics, as well as modeling the space/time characteristics of earthquake occurrence. Utilizes theoretical/analytical tools and numerical models. Includes an independent project in computer modeling.

**GEO 243B. Earthquake Physics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 144, MATH 010B, PHYS 040C, basic computer programming experience; or consent of instructor. MATH 046 is recommended. An exploration of the physics of the earthquake process. Focuses on fault dynamics during the earthquake rupture and slip processes and its relationship to ground motion. Utilizes theoretical/analytical tools and numerical models. Includes an independent project in computer modeling.

**GEO 244. Space Geodesy (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the study of the shape and deformation of the Earth's surface using satellite data (InSAR and GPS). Includes measuring topography and surface deformation; processing, visualization and interpretation of data; simple analytical and numerical deformation models; and applications of techniques to tectonic, volcanic, and non-tectonic problems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**GEO 245. Principles and Applications of Geochronology (4)** Lecture, 2 hours; laboratory, 3 hours; field, 30 hours per quarter. Prerequisite(s): consent of instructor. Examines methods of dating Quaternary successions, including isotopic, physical, chemical, and stratigraphic techniques. Fieldwork and laboratory emphasize the collection, preparation, and analysis of samples using modern methods.

**GEO 247. Electrical Exploration Methods (4)** Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): MATH 009A, MATH 009B, MATH 009C, PHYS 040C; or consent of instructor. Study of electrical properties of Earth's materials. Galvanic resistivity methods in a multilayered medium. Potential distribution and interpretation of empirical data. Electrical well logging. Elements of telluric and magneto-telluric sounding.

**GEO 249. Tectonic Geomorphology and Quaternary Field Techniques (4)** Lecture, 2 hours; discussion, 1 hour; four half-day and two 1-day field trips. Prerequisite(s): GEO 101 or GEO 162 or consent of instructor. Examines topics in tectonic geomorphology. Includes paleoseismology, geodesy, geochronology, landscape response, numerical modeling, and terrain analysis. Covers field techniques such as relative and calibrated dating analysis, section measurements, morpho- and lithostratigraphic analysis, and reconstruction of Quaternary events from landforms. Also addresses map constructions in fluvial, lacustrine, glacial, coastal, and eolian environments.

**GEO 250. Graduate Seminar in Geological Sciences (1)** Seminar, 1 hour. Prerequisite(s): graduate student status. Oral reports by graduate students, faculty, and visiting scholars on current research topics in geological sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GEO 251 (E-Z). Advanced Topics in Paleontology (3-5)** Seminar, 3 hours; laboratory, 0-6 hours. Prerequisite(s): consent of instructor. Selected advanced topics in paleontology. Content varies from quarter to quarter. After consultation with the instructor, students enroll in only the seminar (3 units) or in both the seminar and laboratory (4-5 units). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable.

**GEO 252. Marine Paleoecology (3)** Lecture, 1 hour; discussion, 1 hour; two 1-day field trips. Prerequisite(s): graduate standing. Examines fundamental principles of paleoecology and the measurement of biodiversity, abundance, and biomass from the fossil record. Covers the significance of mass extinctions, diversification events, and environments on the Earth's changing marine ecosystem. Includes taphonomy, ichnology, and field studies. Course is repeatable to a maximum of 6 units.

**GEO 253. Advanced Topics in Petrology and Geochemistry (3-5)** Seminar, 3 hours; laboratory, 0-6 hours. Prerequisite(s): consent of instructor. Selected advanced topics from petrology and geochemistry of igneous, metamorphic, and sedimentary rocks. Course content varies from year to year. Course is repeatable to a maximum of 6 to 10 units.

**GEO 254. Topics in Paleobiology (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores selected contemporary topics in the area of paleobiology including evolutionary radiations, mass extinctions, paleoecology, biotic response to climate change, and the evolution of animals on planet Earth. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**GEO 255. Advanced Topics in Sedimentary Petrology (4)** Seminar, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 225A, GEO 225B. Selected advanced topics from sedimentary petrology and physical stratigraphy. Course content varies from year to year. Course is repeatable.

**GEO 256. Earth's Deep Interior: Frontiers in Mantle Petrology and Mineralogy (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): GEO 001 or GEO 030 or equivalent. Discusses mineral reactions in extreme conditions in the Earth's mantle and at the core-mantle boundary, the possible fate of continental and oceanic plates subducted to Earth's deep interior, and new models of the origin and evolution of mantle convection and plumes. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

**GEO 257. Current Issues in Seismology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores current topics in seismology that are not covered by existing graduate courses. Discussion and research topics may include the history of seismology, source mechanics, seismic wave propagation, site effects, earthquake prediction, and whole-Earth structure. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**GEO 257 (E-Z). Advanced Topics in Geophysics (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): consent of instructor. Selected advanced topics from geophysics. Course content

varies from quarter to quarter. Each segment is repeatable to a maximum of 12 units.

**GEO 259. Tectonics of California (4)** Lecture, 2 hours; seminar, 2 hours. Prerequisite(s): consent of instructor. Geological, geophysical, and paleontological bases of interpreting tectonic development of California, with special emphasis on southern California. Interdisciplinary approach will be emphasized. Weekly reading assignments, active participation in discussions, and appropriate field and library research will be required. Participants will prepare two papers and give presentations.

**GEO 260. Global Climate Change (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): PHYS 002C or PHYS 040C or consent of instructor. Explores global climate change in historic and geologic time scales. Topics include ocean-atmosphere feedbacks, El Niño, Pacific decadal oscillation, anthropogenic CO<sub>2</sub>, volcanism, cosmic rays, polar ozone depletion, global climate modeling, stable isotopes, "ice house" Pleistocene climates, "greenhouse" climates of the Mesozoic and Tertiary, plate tectonics, and the "snowball" Earth.

**GEO 263. Organic and Petroleum Geochemistry (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing; BIOL 010/GEO 003; CHEM 001C or equivalent; or consent of instructor. Explores the geologic fate of organic molecules in the sedimentary record, from fossil DNA to lipids. Addresses current analytical techniques used for detecting molecular fossils and for characterizing sedimentary organic matter. Covers topical applications of organic geochemical tools to archaeology, geobiology, paleoclimatic and paleoenvironmental reconstruction, petroleum exploration, and cosmochemistry research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**GEO 264. Biogeochemical Cycles through Time (3)** Lecture, 3 hours; two to three 2-day field trips. Prerequisite(s): BIOL 010/GEO 003; CHEM 001C or equivalent; GEO 001; GEO 002; or consent of instructor. A comprehensive exploration of the major biogeochemical cycles at and near Earth's surface. Emphasis is on microbially mediated cycling of elements and isotopes within diverse sedimentary environments and the cause-and-effect relationships with the ocean and atmosphere. Explores 4 billion years of biospheric evolution in light of these cycles. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**GEO 265. Special Topics in Earth and Environmental Sciences (1-3)** Seminar, 1-3 hours. Prerequisite(s): graduate standing. Involves oral presentations and small-group discussions of selected topics in the areas of biogeochemistry, global climate change, geomicrobiology, earth surface processes, and interplanetary life. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 10 units. Cross-listed with ENSC 265.

**GEO 268. Seminar in Biogeography (4)** Seminar, 2 hours; research, 6 hours. Prerequisite(s): graduate standing. Topics include Mediterranean ecosystems, fire ecology, naturalization of exotic species, succession and ecosystem steady state theory, and mapping of vegetation. Course is repeatable to a maximum of 8 units.

**GEO 290. Directed Studies (1-6)** Prerequisite(s): consent of instructor. Research and special studies in the geological sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GEO 297. Directed Research (1-6)** Prerequisite(s): consent of instructor. Research for individual graduate

students in geological sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GEO 299M. Research for Master's Thesis (1-12)** research, 3 hours per unit. Prerequisite(s): consent of instructor. Thesis research. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GEO 299P. Research for Dissertation (1-12)** research, 3 hours per unit. Prerequisite(s): consent of instructor. Research for dissertation, arranged in consultation with the staff. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**GEO 301. Teaching of Geosciences at the College Level (1)** Seminar, 1 hour. Prerequisite(s): graduate standing in Geological Sciences. A program of weekly meetings and individual formative evaluation required of new Teaching Assistants for Geosciences courses. Covers instructional methods and classroom/section activities most suitable for teaching Geosciences. Conducted by the Teaching Assistant Development Program. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GEO 302. Teaching Practicum (1-4)** Seminar, 1-4 hours; practicum, 2-8 hours. Prerequisite(s): restricted to those graduate students appointed as Teaching Assistants. Supervised teaching of upper and lower-division courses in Geosciences. Required of all Teaching Assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable for credit, but units not applicable toward degree unit requirements.

## Economics

**Subject abbreviation: ECON**  
**College of Humanities, Arts, and Social Sciences**

Aman Ullah, Ph.D., Chair  
Department Office, 4133 Sproul  
(951) 827-1470; [economics.ucr.edu](http://economics.ucr.edu)

### Professors

Richard Arnott, Ph.D.  
Taradas Bandyopadhyay, Ph.D.  
Marcelle Chauvet, Ph.D.  
Stephen E. Cullenberg, Ph.D.  
Anil B. Deolalikar, Ph.D.  
Gary A. Dymmski, Ph.D.  
David H. Fairris, Ph.D.  
Mason Gaffney, Ph.D.  
Gloria González-Rivera, Ph.D.  
Jang-Ting Guo, Ph.D.  
Tae-Hwy Lee, Ph.D.  
Victor D. Lippit, Ph.D.  
David Malueg, Ph.D.  
Aman Ullah, Ph.D.

### Professors Emeriti

Susan B. Carter, Ph.D.  
Ronald H. Chilcote, Ph.D.  
Keith B. Griffin, Ph.D.  
Azizur R. Khan, Ph.D.  
Prasanta K. Pattanaik, Ph.D.  
R. Robert Russell, Ph.D.  
Howard J. Sherman, Ph.D., Jur.D.  
Richard C. Sutch, Ph.D.

### Associate Professor

Steven M. Helfand, Ph.D.  
Mindy Marks, Ph.D.

### Assistant Professors

Jorge Agüero, Ph.D.  
Urmee Khan, Ph.D.

Todd Sorensen, Ph.D.  
Ming Hon Suen, Ph.D.  
Victoria Umanskaya, Ph.D.

\*\*

#### Cooperating Faculty

Kenneth A. Baerenklau, Ph.D. (Environmental Sciences)  
Linda Fernandez, Ph.D. (Environmental Sciences)  
Keith C. Knapp, Ph.D. (Environmental Sciences)  
Roger L. Ransom, Ph.D. (History)  
Kurt A. Schwabe, Ph.D. (Environmental Sciences)  
Henry J. Vaux, Jr., Ph.D. (Environmental Sciences)

## Majors

Economics studies the production and distribution of goods and services, as well as the way in which productive activity helps shape social existence. Economists are concerned with the factors determining national income, inflation, unemployment, output, growth and inequality (macroeconomics), as well as the behavior of individual decision-making units like households and firms (microeconomics). Economists are also concerned with the role of markets, money and interest rates, the forces affecting international trade, and many other problems of production and distribution.

Economics is the basis for many careers, some of which require only a B.A. degree while others require more advanced work. Possible careers include business, government, education and law.

The B.A. is the most general degree offered in economics. It is appropriate background for a wide variety of purposes, including graduate study and professional schools. However, those planning to attend a graduate program in economics may need more quantitative training than the B.A. requires. Students who are considering attending a graduate program in economics should consult with their undergraduate advisor. The Business Economics B.A. degree provides more specific preparation for careers in business administration or management or for graduate work in business.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

MATH 009A and MATH 009B may also be used to meet breadth requirements.

## Major Requirements

The Economics Department offers B.A. degrees in Economics, Business Economics, Economics/Administrative Studies, and Economics/Law and Society.

### Economics Major

The major requirements for the B.A. degree in Economics are as follows:

1. Lower-division requirements (4 courses [at least 16 units])
  - a) ECON 002, ECON 003

b) MATH 008B or MATH 009A or MATH 09HA, MATH 009B

2. Upper-division requirements (12 courses [at least 48 units])

a) ECON 104A, ECON 104B

b) ECON 105A, ECON 105B

c) One course chosen from ECON 123/HISA 123, ECON 124, or ECON 125

d) ECON 101 and ECON 107

e) Five additional upper-division courses in Economics worth 4 or 5 units each, including at least three that have either ECON 104A or ECON 105A or ECON 107 as a prerequisite. Two 2-unit courses can satisfy one 4- or 5-unit course.

**Note** Up to 4 units of internship credit may be counted toward the upper-division electives in Economics.

### Business Economics Major

The major requirements for a B.A. degree in Business Economics are as follows:

1. Lower-division requirements (five courses [at least 20 units])

a) ECON 002, ECON 003

b) BUS 020

c) MATH 008B or MATH 009A or MATH 09HA, MATH 009B

2. Upper-division requirements (12 courses [at least 48 units])

a) ECON 104A, ECON 104B

b) ECON 105A, ECON 105B

c) ECON 101 and ECON 107

d) Five additional upper-division courses in Economics worth 4 or 5 units each, including at least two courses from ECON 108, ECON 130, ECON 135, BUS 153/ECON 153, BUS 160/ECON 160, BUS 162/ECON 162, ECON 163. Two 2-unit courses can satisfy one 4- or 5-unit elective course.

e) One course chosen from POSC 182, PSYC 142, SOC 151

**Note** Up to 4 units of internship credit may be counted toward the upper-division electives in Business Economics.

### Economics/Administrative Studies Major

In order to receive a B.A. degree in Economics/Administrative Studies students must fulfill the following requirements:

**Economics requirements** (12 courses, 48 units)

1. ECON 002, ECON 003

2. ECON 104A, ECON 104B, ECON 105A

3. Five additional upper-division courses in Economics worth 4 or 5 units each, including at least two that have either ECON 104A or ECON 105A or ECON 107 as a prerequisite. ECON 107 may be chosen as

an advanced elective. Two 2-unit courses can satisfy one 4-unit course.

4. ECON 101

5. One of MATH 008B, MATH 009A, MATH 009HA, or equivalent

**Note** Up to 4 units of internship credit may be counted toward the upper-division electives in Economics.

**Administrative Studies requirements** (37 units)

1. Lower-division courses (17 units)

a) BUS 010, BUS 020

b) STAT 048 or equivalent (may be used to satisfy breadth requirements)

c) CS 008 (may be used to satisfy breadth requirements)

2. Upper-division requirements (20 units)

a) Two courses (8 units) from the list below:

(1) ECON 102 or ECON 104A or ECON 162/BUS 162

(2) PSYC 140 or PSYC 142

(3) SOC 150 or SOC 151 or SOC 171

(4) POSC 181 or POSC 182 or POSC 183

(5) ANTH 127 or ANTH 131

These two courses must be outside the discipline of Economics and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.

b) A three-course track (12 units) in Business Administration courses from one of the following:

(1) Organizations (General): BUS 100, BUS 107, BUS 176/SOC 176, BUS 158/ANTH 105, SOC 150, SOC 151

(2) Human Resources Management/Labor Relations: BUS 100, BUS 107, BUS 152/ECON 152, BUS 153/ECON 153, BUS 155, BUS 157, PSYC 142

(3) Business and Society: BUS 100, BUS 102, BUS 107, PHIL 116, POSC 182, POSC 186

(4) Marketing: BUS 103, and two from BUS 112, BUS 113, BUS 114, BUS 117

(5) Managerial Accounting/Taxation: BUS 108, and two from BUS 166, BUS 168A, BUS 168B

(6) Financial Accounting: BUS 108, BUS 165A, BUS 165B

(7) Finance: BUS 106/ECON 134 and two from BUS 134, BUS 136, BUS 137, BUS 138, BUS 139

(8) Management Information Systems: BUS 101, BUS 171, BUS 173

(9) Production Management: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

**Note** In filling the dual requirements of the major students may not count more than two courses toward both parts of their total requirements. (This limitation applies to specified Economics requirements and specified Administrative Studies requirements, but does not apply to the required Mathematics and Statistics courses.)

### Economics/Law and Society Major

The major requirements for the B.A. degree in Economics/Law and Society are as follows:

1. **Economics requirements** (11 courses [at least 44 units])
  - a) ECON 002, ECON 003
  - b) ECON 119
  - c) ECON 104A, ECON 104B, ECON 105A
  - d) Five additional upper-division courses in Economics worth 4 or 5 units each, including at least two that have either ECON 104A or ECON 105A or ECON 107 as a prerequisite. ECON 107 may be chosen as an advanced elective. Two 2-unit courses can replace one 4- or 5-unit elective course.
- Note** Up to 4 units of internship credit may be counted toward the upper-division elective courses in Economics.
2. **Law and Society requirements** (36 units)
  - a) PHIL 007 or PHIL 007H
  - b) LWSO 100
  - c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
  - d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
  - e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
  - f) LWSO 193, Senior Seminar

**Note** For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements. (This limitation applies to specified Economics requirements and Law and Society requirements.)

### Minor

The minor in Economics provides a background in this discipline. Students take basic microeconomic and macroeconomic theory courses, and then are given freedom of choice in pursuing upper-division courses of great interest.

All candidates for the minor in Economics must take

1. Lower-division requirements (5-10 units): ECON 004 or ECON 002, and ECON 003

2. Upper-division requirements (at least 26 units):
  - a) ECON 102 or ECON 104A, ECON 103 or ECON 105A
  - b) Four additional upper-division courses (at least 16 units) in Economics

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Graduate Program

The Department of Economics offers the M.A. and Ph.D. degrees in Economics.

The graduate Economics program is designed to prepare students for research and teaching in academic institutions as well as for positions in government, international agencies, and the private sector.

**Admission** Students are normally admitted only in the fall quarter. Applicants should apply electronically, at [www.graduate.ucr.edu](http://www.graduate.ucr.edu). Students submit the completed application, GRE scores, three letters of recommendation (from persons familiar with the student's academic work), and transcripts in duplicate of previous academic work.

**Master's Program** Students should have first-year calculus, a course in statistics, and some background in economics before beginning course work. Students who do not meet these requirements may still be admitted but normally must take these courses as prerequisites to the required courses. Applicants to the M.A. program must have the same academic potential as Ph.D. applicants, as reflected by GPA and GRE scores. Admission to the M.A. program does not guarantee later admission to the Ph.D. program.

**Doctoral Program** The department encourages applicants from a variety of backgrounds, but a good understanding of intermediate microeconomics, intermediate macroeconomics, multivariate calculus, and elementary linear algebra is necessary to begin taking the core requirements, described below. In addition, two courses in basic probability and statistics or econometrics are required before beginning the core econometrics sequence. Students who do not satisfy the requirements, or who have been out of school for several years, should consider enrolling in the one-year M.A. program.

### Master's Degree

The M.A. degree is designed as a preparatory program for those students interested in pursuing the Ph.D. but who are not adequately prepared to enter the Ph.D. program directly (e.g., students who lack the necessary prerequisites in economics or mathematics or students who have been out of school for some time).

### Doctoral Degree

The Ph.D. is the primary degree objective of the graduate program. Students first complete a core curriculum in economic theory and quantitative methods. These courses provide training in the fundamental concepts and research methods of the discipline. Following demonstration of professional competence in the core areas, students specialize in theoretical or applied areas of economics. This leads to the development of independent research and the writing of the Ph.D. dissertation.

### Core Requirements

#### 1. Economic Theory

Students must complete the following:

- a) ECON 200A, ECON 200B, ECON 200C (Microeconomic Theory)
- b) ECON 201A, ECON 201B, ECON 201C (Macroeconomic Theory)
- c) ECON 212 (History of Economic Theory and Methodology) or ECON 213 (Methods and Themes in Economic History)

All students must pass two cumulative examinations: one in microeconomic theory (covering topics encompassed in the course sequence ECON 200A, ECON 200B, and ECON 200C) and one in macroeconomic theory (covering the topics covered in ECON 201A, ECON 201B, ECON 201C). Both examinations are given at the end of the first year, at the beginning of the fall quarter. After completing the sequence of courses, students must sit for each examination at each offering until they have passed the requirement. An unexcused failure to sit for a required examination will be regarded as a failure. No student will be given more than three attempts to achieve a satisfactory grade on each one of the two examinations. Copies of the rules regarding these cumulative examinations are available in the department office.

#### 2. Quantitative Methods

Students must complete the following: ECON 205A, ECON 205B, ECON 205C (Econometric Methods I, II, III)

To satisfy these course requirements, students must attain a "B" average in the sequences ECON 200A, ECON 200B, and ECON 200C; ECON 201A, ECON 201B, and ECON 201C; and ECON 205A, ECON 205B, and ECON 205C. They also must receive a grade of "B-" or better in ECON 212 or ECON 213. Core courses may be waived, based on equivalent graduate work completed elsewhere. The comprehensive examinations, however, may not be waived.

### Colloquium Requirement

Students must enroll in at least one offering of ECON 289 (Colloquium in Economics) each quarter of their formal residence. In addition, students must give a presentation on their thesis research within one year of advancing to candidacy or by the fall term of their fourth year, which ever comes first.

## Field Requirement

All students must:

i. complete course work in a major field consisting of three courses.

or

ii. take four additional field courses. Students must pass a comprehensive examination in their major field.

Comprehensive examinations in each major field are given twice a year.

### 1. Advanced Econometrics

Students must complete the courses a) and b) and one of the courses from c), d), e), or f) listed below.

- ECON 285E (Advanced Econometric Methods)
- ECON 285F (Topics in Econometrics)
- ECON 285G (Applied Econometrics)
- ECON 285-I (Macroeconometrics)
- ECON 285J (Nonparametric Econometrics)
- ECON 285K (Microeconometrics)

### 2. Advanced Macroeconomic Theory

Students must complete the following:

- ECON 282E (Foundations of Macroeconomics)
- ECON 282F (Advanced Monetary Theory)
- ECON 282G (Special Topics in Macroeconomic Theory)

### 3. Advanced Microeconomic Theory

Students must complete three of the following:

- ECON 283E (Rational Choice Theory)
- ECON 283F (Measurement and Aggregation in Economics)
- ECON 283G (General Equilibrium)
- ECON 283I (Social Choice and Welfare)
- ECON 283J (Uncertainty and Information)
- ECON 283K (Special Topics in Microeconomic Theory)

### 4. Advanced Political Economy

ECON 202A (Topics in Economic Theory: Critiques and Alternative Approaches) is recommended.

Students must complete three of the following:

- ECON 272A (Political Economy: Marxian Economics)
- ECON 272B (Political Economy: Efficiency, Justice, and Power)
- ECON 272C (Political Economy: Comparative Political Economy)
- ECON 271 (Radical Political Economy)
- ECON 279 (Political Economy: Advanced Topics)

### 5. Development Economics

Students must complete three of the following:

- ECON 260 (Theories of Economic Development)
- ECON 261 (Contemporary Development Strategies)
- ECON 262 (Project Evaluation in Developing Countries)
- ECON 265 (Agricultural and Rural Development)
- ECON 266 (The Political Economy of Imperialism)

### 6. Economic History

Students must complete three of the following:

- ECON 212 (History of Economic Theory and Methodology)
- ECON 213 (Methods and Themes in Economic History)
- ECON 223 (American Economic History)
- ECON 224 (Economic History of the World Economy in the Twentieth Century)

### 7. International Trade Theory

Students must complete the following:

- ECON 234 (International Trade Theory)
- ECON 235 (Topics in International Trade Theory)

### 8. Labor Economics

Students must complete three of the following:

- ECON 240 (Labor Supply, Labor Demand, and the Structure of Wages)
- ECON 241 (Labor Institutions and Macro Labor Outcomes)
- ECON 243 (Topics in Labor)
- ECON 244 (Empirical Research Methods)

### 9. Money, Credit, and Business Cycles

Students must complete three of the following:

- ECON 250 (Money, Credit, and the Macroeconomy)
- ECON 251 (Business Cycle Theory)
- ECON 254 (Topics in Money, Credit, and Business Cycles)

### 10. Resource and Environmental Economics

Students must complete three of the following:

- ECON 207 (Environmental Economics)
- ECON 208 (Models of Nonrenewable Resource Management)
- ECON 209 (Models of Renewable Resource Management)
- ECON 210 (Topics in Environmental Economics)

### 11. Public Economics

Students must complete the following:

- ECON 246 (Introduction to Public Economics)
- ECON 247 (Recent Advances in Public Economics)

Not all of these fields and courses are offered every year; offerings depend primarily on student demand.

As the department faculty is expanding, we expect to add additional fields in the near future. These may include International Economics and Health Economics.

**Oral Qualifying Examination** Students must pass an oral qualifying examination, which covers a dissertation prospectus and subject matter related to the student's major field and other field courses. It is given by a committee of five faculty members, at least one of whom is not a Department of Economics faculty member. Students who enter the program fully prepared normally take the examination before the beginning of the third year.

**Dissertation and Final Examination** The final requirement is the completion of a dissertation, under the direction of a dissertation committee, and passing a final examination defending the dissertation. The dissertation committee is normally composed of three Department of Economics faculty members (including cooperating faculty), usually chosen from the oral qualifying examination committee. Students who enter the program fully prepared normally complete the dissertation by the end of the fifth year. Students are encouraged to present a dissertation prospectus to a meeting of ECON 289 in their third year.

## Master's Degree

**Plan II (Comprehensive Examination)** Students must complete a total of 36 units, 24 of which must be at the graduate level. Students must complete the following:

- ECON 200A (Microeconomic Theory) or ECON 206 (Mathematics for Economists)
- ECON 204A (Microeconomic Theory for Master's Students) or ECON 200A-ECON 200B (Microeconomic Theory)
- ECON 204B (Macroeconomic Theory for Master's Students) or ECON 201A-ECON 201B (Macroeconomic Theory)
- ECON 205A (Econometric Methods I) and ECON 205B (Econometric Methods II)
- ECON 212 (History of Economic Theory and Methodology) or ECON 213 (Methods and Themes in Economic History)

## Examination Requirements

Students must pass one of the following examinations:

- Master's examination covering the topics in ECON 204A, ECON 204B

2. Doctoral cumulative examination in either microeconomic theory or macroeconomic theory (graded at the master's level)
3. Doctoral Comprehensive Examination in any of the ten fields described above (graded at the master's level)

## Lower-Division Courses

**ECON 001. Introduction to Economics (4)** Lecture, 3 hours; discussion, 1 hour. Examines the history of economic institutions, the ideas of the great economists, and selected contemporary issues.

**ECON 002. Introduction to Macroeconomics (5)** Lecture, 3 hours; discussion, 1 hour; written work, 30 hours per quarter. Prerequisite(s): none. An introduction to the study of the economic system from a macro, or aggregate, perspective. Includes analysis of unemployment, inflation, and the impact of government policies on the level of economic activity. Credit is awarded for only one of ECON 002, ECON 002H, or ECON 004.

**ECON 002H. Honors Introduction to Macroeconomics (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 3-3.5 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ECON 002. An introduction to the study of the economic system from a macro, or aggregate, perspective. Includes analysis of unemployment, inflation, and the impact of government policies on the level of economic activity. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ECON 002, ECON 002H, or ECON 004.

**ECON 003. Introduction to Microeconomics (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. An introduction to the study of the economic system from the micro, or individual decision-maker's, perspective. Includes analysis of competition, monopoly, and the distribution of income. Credit is awarded for only one of ECON 003 or ECON 004.

**ECON 004. Principles of Economics (5)** Lecture, 4 hours; discussion, 1 hour. Prerequisite(s): a status in pre-Business or Business Preparatory or a major in Business Administration. Studies the economic system from both the micro, or individual decision-maker's perspective, and macro, or aggregate perspective. Includes analysis of competition, monopoly, distribution of income, unemployment, inflation, and the impact of government policies on economic activity. Credit is awarded for only one of ECON 002, ECON 002H, or ECON 004 and for only one of ECON 003 or ECON 004.

**ECON 005. Data Analysis for Economics and Business (5)** Lecture, 3 hours; outside research, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004; or consent of instructor. Introduction to the sources of economic and business data and data analysis using graphs, plots, computers, and descriptive statistics. Also covers index numbers, measures of inequality, and simple regression analysis.

**ECON 006. Introduction to Environmental Economics (4)** Lecture, 3 hours; discussion, 1 hour. An introduction to the basic principles of economics and their application to problems of environmental quality and natural resource utilization. Emphasis is on the failure of markets as a cause of environmental degradation and the role of government in resolving problems of resource scarcity. Does not satisfy the Natural Science breadth requirement for the College of Humanities, Arts, and Social Sciences. Cross-listed

with ENSC 006. *Does not satisfy the Natural Science breadth requirement for the College of Humanities, Arts, and Social Sciences.*

**ECON 060. Engineering Economics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009A. Covers economic decisions involving engineering alternatives. Topics include time value of money, annual cost, present worth, rate of return, and benefit-to-cost. Addresses before and after tax replacement economy, organizational financing, break-even analysis, risk analysis, and capital budgeting. Cross-listed with ENGR 060.

## Upper-Division Courses

**ECON 101. Statistics for Economics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; individual laboratory, 2 hours. Prerequisite(s): MATH 008B or MATH 009A or MATH 09HA or MATH 022 or equivalent. An introduction to the basic statistical methods for economics. Topics include economic data analysis, index numbers, univariate and bivariate probability distributions, correlation and regression, sampling distributions, properties of estimators, and hypothesis testing.

**ECON 102. Intermediate Microeconomics (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 003 or ECON 004; MATH 008B or MATH 009A or MATH 09HA or MATH 022. A comprehensive overview of the competitive market system. Includes the modern utility theory of consumer behavior, firm behavior in product and factor markets, and monopoly. Emphasizes theoretical applications to business enterprises. Intended for students planning to major in Business Administration. Credit is awarded for only one of ECON 102 or ECON 104A.

**ECON 103. Intermediate Macroeconomics (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 004. Covers the theory of income, employment, price level and the role of the international economy. Includes fiscal and monetary policy. Intended for students planning to major in Business Administration. Credit is awarded for only one of ECON 103 or ECON 105A.

**ECON 104A. Intermediate Microeconomic Theory (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 003; MATH 008B or MATH 009A or MATH 09HA. A calculus-based course that addresses developing theories of consumers and firms. Provides the foundation for partial equilibrium study of competitive and monopoly markets. Explores derived welfare properties of competitive markets as benchmarks for evaluating monopolies. Develops theories of monopoly pricing and strategy. Evaluates alternative policies as related to monopoly. Credit is awarded for only one of ECON 102 or ECON 104A.

**ECON 104B. Intermediate Microeconomic Theory (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 102 with a grade of "C" or better or ECON 104A or consent of instructor. A continuation of ECON 102 or ECON 104A. Covers imperfect competition, general equilibrium, and welfare economics. Also addresses intertemporal decision making, uncertainty, and related information.

**ECON 105A. Intermediate Macroeconomic Theory (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 002 or ECON 002H. Examines the determination of the equilibrium level of national income and its allocation among consumers, investors, and government. Develops theoretical models that describe how employment, production, and inflation are determined. Focuses on the impact of

government policies, as well as the current developments on these issues. Credit is awarded for only one of ECON 103 or ECON 105A.

**ECON 105B. Intermediate Macroeconomic Theory (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 103 with a grade of "C" or better or ECON 105A. ECON 104A is recommended. A continuation of ECON 103 or ECON 105A. Investigates developments in macroeconomic theory and events. Presents models that explain economic growth and business cycle fluctuations. Explores their empirical relevance and policy implications.

**ECON 107. Introductory Econometrics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; outside research, 1 hour; written work, 1 hour. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 004; ECON 101; or consent of instructor. An introduction to the basic tools of econometrics. Focuses on the issues relating to the linear regression model, including heteroskedasticity, serial correlation, and multicollinearity.

**ECON 108. Introductory Econometrics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; written work, 1 hour; outside research, 1 hour. Prerequisite(s): ECON 107 or consent of instructor. A continuation of ECON 107. Covers, at an introductory level, the basic concepts related to logit and probit models, simultaneous equations models, dynamic time series models, unit roots and auto-regressive conditional heteroskedasticity (ARCH), and forecasting.

**ECON 110. Mathematical Economics (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 104B, MATH 010A, MATH 131. Covers mathematical concepts and techniques used in advanced economic analysis. Explores applications to selected aspects of economic theory.

**ECON 111. Research Methods in Business and Economics (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 004. Introduction to research methods in business and economics. Topics include the scientific method and notions of progress in science, problems of research design, data sources and data gathering techniques, the case study method, and measurement and interpretation of business and economic data.

**ECON 112. Forecasting in Business and Economics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; written work, 2 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 004 or equivalent; ECON 107; or consent of instructor. Provides a basic knowledge of forecasting and its applications, particularly by using business and economic data. Covers basic methods of forecasting, such as regression methods, exponential smoothing, algorithms, and autoregressive integrated moving average (ARIMA) methods. Also explores how to combine and evaluate various forecasts. Uses computer analysis extensively.

**ECON 115. Marxian Political Economy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Fundamental concepts of Marxian political economy, including historical materialism, surplus value, exploitation, class analysis, economic crises, the state, socialism, and Marxian methodological foundations.

**ECON 116. Foundations of Political Economy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores ways of thinking about economic and social issues precluded by conventional approaches to economic analysis. Topics include the

class relations between labor and capital, discrimination, market socialism, and alternative perspectives on development, macroeconomic instability, and the environment.

**ECON 117. Economics and Philosophy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B or consent of instructor. Examines issues on the boundary of economics and philosophy. Topics include social choice theory and economic justice; foundations of utility theory, rational choice, and economic welfare; and epistemology and the philosophies of science of Popper, Kuhn, and others. Cross-listed with PHIL 119.

**ECON 118. The Contemporary United States Economy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 105B. Provides an in-depth analysis of the U.S. economy with an emphasis on its contemporary structure. Incorporates issues related to macroeconomics. Focuses on questions that are relevant to current policy.

**ECON 119. Law and Economics (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 004 or consent of instructor. An economic analysis of legal institutions and their evolution, including the areas of property laws, contract law, tort law, and criminal law.

**ECON 120. The Great Economists (4)** Lecture, 6 hours; individual study, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. In-depth study of selected influential writers or a school of writers on economics or political economy. Emphasis is on selected writers' relations to other schools and other writers. Offered in summer only.

**ECON 121 (E-Z). Readings in Economics (2)** for hours and prerequisites, see segment descriptions. In-depth discussion of a book that is not a textbook that offers important insights into economic issues.

**ECON 121E. The Wizard of Oz (2)** Lecture, 15 hours per quarter; written work, 15 hours per quarter. Prerequisite(s): ECON 002 or ECON 002H, ECON 003; or ECON 004. Focuses on the Populist Movement, the rise of William Jennings Bryan's third-party presidential bid, and the contemporary political struggle regarding management of the U.S. money supply.

**ECON 121F. The Revolutions in Agricultural Biology (2)** Lecture, 15 hours per quarter; individual study, 15 hours per quarter. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004; or consent of instructor. Explores the history of biotechnology. Covers the impact on standards of living, the distribution of welfare, and the pace and pattern of economic growth. Topics include the origin of agriculture, the Columbian Exchange, the dwarfing of wheat and rice, hybrid corn, and the adoption of genetically modified crops.

**ECON 121G. The Great Crash and the Great Depression (2)** Lecture, 15 hours per quarter; individual study, 15 hours per quarter. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004; or consent of the instructor. What caused the great stock market crash of 1929? Did the market crash cause the Great Depression of the 1930s? What were some of the economic and social consequences? Can it happen again? Explores these and related questions from the most significant economic disruption in American economic history.

**ECON 122 (E-Z). Economic Issues in the News (2)** for hours and prerequisites, see segment descriptions. An in-depth examination of a current economic issue.

**ECON 122E. Economic Aspects of Contemporary Mexican Immigration to the United States (2)** Lecture, 15 hours per quarter; written work, 15 hours per quarter. Prerequisite(s): ECON 002 or ECON 002H, ECON 003; or ECON 004. Examines the origin and nature of migrant flows, their implications for the economic development of Mexico, and impacts on U.S. labor markets, income and wage inequality, provision of social services, and the evolution of government policy.

**ECON 122F. The Federal Deficit and the National Debt (2)** Lecture, 15 hours per quarter; individual study, 15 hours per quarter. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004; or consent of instructor. Studies revenues, expenditures, and tax policies of the federal government, focusing on causes and consequences of federal deficit spending. Topics include discretionary and mandatory spending (social security benefits, Medicare, etc.), tax credits and loopholes, debt finance, the life-cycle hypothesis of saving, and the burden of the national debt.

**ECON 123. American Economic History (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004. Covers the economic history of the United States from colonial times to the present. Cross-listed with HISA 123.

**ECON 124. World Economic History (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H, ECON 003; or ECON 004. Covers the economic history of the world from Paleolithic times to the present.

**ECON 125. History of Economic Thought (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H, ECON 003; or ECON 004. Study of the development of major economic theories, including those of Adam Smith, Karl Marx, and John Maynard Keynes. Focus is on how alternative theories define and address economic problems differently and the policy implications that follow.

**ECON 129. Health Economics (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. An economic analysis of health and medical care, medical technology, and the functioning of insurance markets. Emphasizes the dynamics of insurance companies, physicians, and the pharmaceutical industry. Issues addressed include the rising cost of health care, government involvement, and health care reform.

**ECON 130. Introduction to Money, Banking, and Credit (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): ECON 103 or ECON 105A. Covers the basic theories of modern monetary systems. Explores money, credit, and interest rate behavior; financial intermediation and central banking; and methods and objectives of monetary and regulatory policy.

**ECON 132. Public Finance (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A; ECON 103 or ECON 105A; BUS 106/ECON 134 or ECON 130 is recommended. Covers functions of government in a market economy. Includes distributive equity, taxation, spending, borrowing, and debt management. Examines promotion of capital formation, full employment, stability, and efficient resource use. Also addresses intergovernmental relations.

**ECON 134. Introduction to Financial Management (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 101 or STAT 048; ECON 102 or ECON 104A; upper-division standing. An introduction

to financial management and financial institutions. Includes time value of money, stock and bond valuation, risk and return, portfolio theory, capital budgeting, capital structure, dividend policy, and financial databases. Cross-listed with BUS 106.

**ECON 135. The Stock Market (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004. ECON 103 or ECON 105A is strongly recommended. An analysis of the history of the stock market and its role in the macroeconomy. Topics include factors governing stock prices, fundamental and technical analysis, the impact of inflation and interest rates, international investing, and the role of social institutions in the determination of stock prices.

**ECON 136. Empirical Financial Economics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 107 or consent of instructor. Discusses various empirical aspects of financial economics and financial risk management. Addresses both theoretical and applied issues in finance, risk management, and econometrics. Also discusses quantitative analysis, simulation methods, and case studies.

**ECON 143A. Environmental Economics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 003 or ECON 004 or equivalent, MATH 022 or equivalent; or consent of instructor. Introduction to economic analysis of natural resources and the environment with emphasis on environmental quality. Topics include environment-economy interactions and social choice theory; source control costs, damage valuation, and efficient pollution control; and design of efficient and equitable environmental policy. Cross-listed with ENSC 143A.

**ECON 143B. Natural Resource Economics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 143A/ENSC 143A or consent of instructor. Considers the extraction and use of natural resources. Topics include land use and natural capital economics and valuation; economics of mineral and nonrenewable resources including recycling; and managing biological and renewable resources, including common property, efficient usage, and regulation. Cross-listed with ENSC 143B. **Dinar**

**ECON 143C. Ecological Economics and Environmental Valuation (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 143A/ENSC 143A or consent of instructor. Survey of environmental valuation and economy-wide, long time-scale issues. Valuation methods covered include hedonic pricing, weak complements, contingent valuation, and ecosystem services. Environmental macroeconomic topics include population growth, biophysical constraints to economic growth, intertemporal welfare and sustainability, and sustainable development. Cross-listed with ENSC 143C. **Knapp**

**ECON 146. Urban Economic Problems (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Applies economic principles to the major problems of the modern urban community, such as poverty, discrimination, deterioration of the environment, and housing problems. Explores programs for alleviation of or solution to these issues. Cross-listed with URST 146.

**ECON 148. Land and Resource Economics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Explores distinctive qualities of land and its rent, as well as valuation of land as an investment. Addresses assembly, division, and development of land, efficiency of the land market and the effects of taxation. Covers concentrated own-

ership, separation of ownership and management, rent and taxable surplus, and origins and kinds of tenure.

**ECON 152. Economics of Labor Relations (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004. An analysis of the history of labor and industrial relations in the United States. Emphasizes problems of collective action, long-swings of economic growth, income inequality, and the role of government.

**ECON 153. Labor Economics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. An analysis of labor demand, labor supply, and the structure of wages. Emphasizes neoclassical, institutional, and radical perspectives. Cross-listed with BUS 153.

**ECON 155. Women's Labor and the Economy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 003 or ECON 004. Focuses on economic analyses of four topics: women's work in and out of the paid labor force; gender differences in occupation, earnings, and income; marriage, divorce, and childbearing; and public policy regarding women's work and standard of living. Explores differences among women by race, ethnicity, class, marital status, and parental responsibilities. Cross-listed with WMST 155.

**ECON 156. Population Dynamics and Economic Well-being (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004. Examines the causes and consequences of population dynamics. Analyzes economic models of such demographic behavior as fertility, mortality, marriage, and migration. Also explores the consequences of population change for economic growth, the environment, and overall well-being.

**ECON 159. Economics of Art, Entertainment, and Culture (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 004 or consent of instructor. An overview of the economic aspects of art, entertainment, and culture. Includes consumer demand for culture, economic models of nonprofit organizations, and competition and market structure in the arts and entertainment industries. Addresses copyright issues, public support of the arts, and the role and impact of public and private subsidies.

**ECON 160. Industrial Organization (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B. A study of the organization and structure of the American industrial system. Emphasizes production and pricing behavior and policies. Also addresses market structure and public policies regulating or influencing market behavior. Cross-listed with BUS 160.

**ECON 162. Managerial Economics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 102 or ECON 104A. Examines applications of economic analysis to problems of management, especially of capital. Emphasis is on production economics and cost analysis. Cross-listed with BUS 162.

**ECON 163. Economics and Business Strategy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 101, ECON 104B. Provides an understanding of the basic concepts of game theory, as well as many strategic interactions. Includes price wars, cooperation, commitment, bargaining, and the strategic use of information.

**ECON 170 (E-Z). Case Studies in Economic Development (2)** for hours and prerequisites, see segment descriptions. A detailed study of the history,

problems and prospects of economic development in a selected geographical region.

**ECON 170E. Economic Development in India (2)** Lecture, 15 hours per quarter; written work, 15 hours per quarter. Prerequisite(s): ECON 102 or ECON 104A or consent of instructor. A detailed study of the history, problems, and prospects of economic development in India.

**ECON 170F. Economic Development in Australia (2)** Lecture, 15 hours per quarter; individual study, 15 hours per quarter. Prerequisite(s): ECON 002 or ECON 002H, ECON 003; or ECON 004. Discusses Australian economic development from the first European settlements to the present day. Focus is on Australia as a settler economy, created through a process of large-scale migration from well-established states to a land-abundant, previously unorganized region and involving the marginalization of the indigenous population.

**ECON 171. International Finance (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 103 or ECON 105A. Covers international monetary theory and its applications. Topics include balance of payments, exchange rates, open-economy macroeconomics, and international monetary institutions. Addresses selected policy issues.

**ECON 175. Comparative Analysis of Economic Systems (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the varieties of capitalism as well as its characteristic features and systematic problems. Topics also include the search for an alternative; central planning; and market socialism.

**ECON 178. International Trade (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A study of the pure theory of trade, trade policy, and international factor movements. Includes illustrative applications to current issues and problems. Cross-listed with BUS 178.

**ECON 180. Transition from Socialism to Capitalism (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004; or consent of instructor. Examines the transition from central planning to a more market-oriented economic system in Central and Eastern Europe, the countries of the former Soviet Union, China, Mongolia, and Vietnam. Evaluates alternative transition strategies using Russia and China as the key examples.

**ECON 181. Economic Development: Theory and Policy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H, ECON 003; or ECON 004. A survey of the main theories of economic development and an analysis of the major development strategies and policies.

**ECON 182. Trade, Globalization, and Development (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Explores the theory of comparative advantage as a guide to development policy. Discusses trade regimes and their effects on development. Analyzes the nature and consequences of the globalization of the world economy.

**ECON 183. Population and Development (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A; ECON 107; or consent of instructor. A study of interactions between population growth and economic development. Covers the history of demographic thought, models for developing countries based on the demographic experience of currently developed countries. Explores household production models, demand for children, mortality, health and nutrition, migration, and human capital. Traces

macroeconomic economic-demographic linkages in developing countries.

**ECON 184. Economic Development in Africa (4)** Lecture, 3 hours; extra reading, 1 hour; written work, 1 hour; term paper, 1 hour. Prerequisite(s): ECON 102 or ECON 103 or ECON 104A or ECON 105A; ECON 107; or consent of instructor. Examines major current issues in development economics. Focuses on Sub-Saharan Africa.

**ECON 185. Economic Development in Latin America (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 103 or ECON 104A or ECON 105A. A comparative analysis of the major trends in Latin American economies in the twentieth century. Includes historical legacies, primary export economies, the theory and practice of import substitution industrialization, and the debt crisis. Also covers stabilization and structural adjustment, poverty and income distribution, the informal and agricultural sectors, and the environment. Cross-listed with LNST 185.

**ECON 187. Contemporary Public Policy Challenges in Latin America (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 004 or consent of instructor. A survey of the wide-sweeping policy reforms since the 1980s and of contemporary public policy challenges in Latin America. Challenges discussed include extremely high levels of poverty and inequality, inadequate educational and healthcare systems, pressures for land reform, problems of trade competitiveness, and recurring currency crises. Cross-listed with LNST 187.

**ECON 190. Special Studies (1-5)** Course is repeatable to a maximum of 12 units.

**ECON 193A. Senior Seminar (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B, ECON 105B; or consent of instructor. Advanced research in various fields of faculty interest. Includes completion of a research paper and presentation. Topics vary from year to year. Graded In Progress (IP) until ECON 193A and ECON 193B are completed, at which time a final grade is assigned.

**ECON 193B. Senior Seminar (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): senior standing; ECON 193A. Advanced research in various fields of faculty interest. Students complete a research paper and present their results in the seminar. Topics vary from year to year.

**ECON 198-I. Individual Internships in Economics (1-12)** Prerequisite(s): junior standing with major in Economics and consent of instructor (to be obtained before pre-enrollment). Active participation in the work of a public or quasi-public agency or business concern in matters relating to general or business economics. The student spends approximately 10 hours each week with such an employer. A summary paper is required. One unit for every three hours spent in internship. Open to majors on a Satisfactory (S) or No Credit (NC) basis.

**ECON 199H. Senior Honors Research (1-4)** Outside research, 3-12 hours. Prerequisite(s): upper-division standing in Economics; admission to the University Honors Program or consent of instructor. Offers the opportunity for directed research at an honors level. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

## Graduate Courses

**ECON 200A. Microeconomic Theory (6)** Lecture, 4.5 hours; discussion, 1.5 hours. Prerequisite(s): ECON 104B or equivalent. Focuses on consumer and producer theory under conditions of certainty. Covers required mathematics, including real analysis and static optimization theory. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ECON 200B. Microeconomic Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 200A or equivalent. Focuses on decision making under uncertainty, economics of information, applications of game theory, and models of imperfect competition.

**ECON 200C. Microeconomic Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 200B or equivalent. Focuses on general equilibrium theory, including existence and stability, and on welfare economics and social choice.

**ECON 201A. Macroeconomic Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 105B or equivalent; ECON 200A (may be taken concurrently). Examines the basic issues and models of macroeconomics.

**ECON 201B. Macroeconomic Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 201A or equivalent. Covers, but is not limited to, investment and consumption, labor and monetary economics, tax and debt policy, and mathematics for macroeconomists.

**ECON 201C. Macroeconomic Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 201B or equivalent. Focuses on the phenomena of business cycles, both the empirical characteristics and the theoretical models.

**ECON 202A. Topics in Economic Theory: Critiques and Alternative Approaches (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Critiques of conventional economic theories and consideration of alternative theories and approaches to issues of aggregate economic growth and instability from Marx to the present.

**ECON 202B. Topics in Economic Theory: Applications (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A, ECON 200B, ECON 200C, ECON 201A, ECON 201B, ECON 201C; ECON 205A, ECON 205B, ECON 205C. Applies the theories and methods covered in the ECON 200A, ECON 200B, ECON 200C and ECON 201A, ECON 201B, ECON 201C sequences to real-world problems, including (1) the specification of functional form and the estimation of supply and demand systems, (2) index number theory and the measurement of inflation, the cost of living, output, and other macroeconomic phenomena, (3) computable general equilibrium models, (4) programming methods, (5) problems of aggregating over agents and commodities, and (6) the measurement of economic phenomena like productivity, poverty, income and wealth distribution, technical and allocative inefficiency, and input substitutability.

**ECON 205A. Econometric Methods I (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 104A; ECON 105A; MATH 009A; MATH 009B; STAT 100B; or equivalents. Examines econometric methods for the analysis of economic data and the construction of econometric models with applications to microeconomics and macroeconomics. Covers the linear

regression model and related techniques of matrix algebra. Also addresses statistical estimation and inference.

**ECON 205B. Econometric Methods II (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 205A or equivalent. Examines econometric methods covering extensions of the basic regression model, nonlinear models, and limited dependent variable models.

**ECON 205C. Econometric Methods III (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 205B or equivalent. Examines econometric methods for the analysis of economic data and the construction of econometric models with applications to time-series macroeconomics. Covers univariate time-series models, volatility models, simultaneous equation models, and dynamic econometric models.

**ECON 207. Environmental Economics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A or equivalent. Covers the theory and methods of environmental economics. Topics include externality theory, bargaining solutions, property rights, and resource allocation mechanisms; environmental policy under uncertainty and asymmetric information; and dynamic and general equilibrium models of environmental quality.

**ECON 208. Natural Resource Economics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A or equivalent. Covers dynamic models of nonrenewable resources. Topics include uncertainty, game theory, and the measurement of resource scarcity. Examines empirical models of nonrenewable and renewable resources.

**ECON 209. Nonmarket Valuation and Environmental Policy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A; ECON 205A or equivalent. The study of economic valuation of natural resources and the environment. Includes topics such as environmental demand theory, travel cost models, random utility models, discrete choice models, the contingent valuation technique, and hedonic wage and pricing models. Covers theory, empirical methods, and applications.

**ECON 210 (E-Z). Topics in Environmental Economics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 207 or consent of instructor. An in-depth study in selected areas of environmental and natural resource economics. E. Transportation and Environmental Quality. F. Political Economy of Environmental Policy. ECON 210E is repeatable to a maximum of 8 units.

**ECON 212. History of Economic Theory and Methodology (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The origins and contemporary development of alternative economic theories. Methodological and philosophical debates in economics.

**ECON 213. Methods and Themes in Economic History (4)** Lecture, 3 hours; term paper, 1.5 hours; extra reading, 1.5 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys central themes in world economic history to introduce the subject and methodology of economic history. Topics illustrate a wide variety of historical experiences and illuminate the process of economic growth. Economics graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**ECON 223. American Economic History (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction

to economic history as an approach to economics. Surveys major issues pertaining to the historical and institutional bases for the distinctive performance of the American economy. Economics graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**Carter, Sutch**

**ECON 224. Economic History of the World Economy in the Twentieth Century (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to world economic history as an approach to economics. Surveys major issues pertaining to the historical and institutional bases for the performance of the world economy during the twentieth century. Economics graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. **Sutch**

**ECON 234. International Trade Theory (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A, ECON 200B, ECON 200C; or consent of instructor. Examines the determinants of trade in goods and services, international flow of labor and capital, and the effects of trade policy on welfare and income distribution.

**ECON 235. Topics in International Trade Theory (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Prerequisite(s) ECON 234 or consent of instructor. An in-depth study in selected areas of international trade theory. Topics include, but are not limited to, trading blocks, trade agreements and strategic interactions, trade and the environment, and the political economy of international trade. Course is repeatable to a maximum of 8 units.

**ECON 240. Labor Supply, Labor Demand, and the Structure of Wages (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. This course introduces students to the theoretical and empirical literature on labor supply and demand and on the structure of wages. The contributions of neoclassical, institutional, and radical economists will be discussed.

**ECON 241. Labor Institutions and Macro Labor Outcomes (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A historical perspective on industrial structure, personnel management systems, labor unions, and government, and their relation to macro labor outcomes such as income distribution, productivity growth, and unemployment.

**ECON 243. Topics in Labor (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. In-depth study in selected areas of labor economics. Topics include, but are not limited to, economic demography and race and gender issues. Course is repeatable as topics change.

**ECON 244. Empirical Research Methods (4)** Lecture, 3 hours; tutorial, 1 hour; written work, 2 hours. Prerequisite(s): ECON 205B or equivalent. Introduction to empirical techniques used in modern applied economics, with a focus on identification strategies. Topics include natural experiments, instrumental variables, regression discontinuity, and panel data. Emphasis is on practical application of techniques and solutions to problems empirical researchers encounter.

**ECON 246. Introduction to Public Economics (4)** Lecture, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): ECON 200C. An introduction to public economic theory and its applications: Topics include the theory of economic justice, welfare eco-

nomics, the theory of market failure, the positive theory of taxation, and cost-benefit analysis.

**ECON 247. Recent Advances in Public Economics (4)**

Lecture, 3 hours; extra reading, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): ECON 200C. Focuses on the use of controlled and natural experiments, analysis of panel data, and the cross-country study of the role of social, cultural, and economic institutions in economic growth. Also covers theory of the second best; auction theory; theory of government contracting, procurement, and regulation; fiscal federalism theory; and the political economy.

**ECON 250. Money, Credit, and the Macroeconomy (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Investigation of the role of money, credit, and financial institutions in influencing growth, distribution, employment, prices, and business cycles in capitalist economies. Fiscal policy, monetary policy, and public investments are addressed from alternative theoretical perspectives.

**ECON 251. Business Cycle Theory (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An in-depth treatment of theories of the cycle and empirical data on relations of variables over the cycle.

**ECON 254. Topics in Money, Credit, and Business Cycles (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the performance of the macroeconomy, monetary and fiscal theory, and monetary and fiscal policy.

**ECON 260. Theories of Economic Development (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A survey of the major theories of development and underdevelopment beginning with the classical model, theories of surplus, and including the models of Lewis, Nurkse, Hirschman, neoclassical schools, structuralist models, and dependency theory.

**ECON 261. Contemporary Development Strategies (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A review of the performance of the major strategies of development implemented in the recent past or currently under implementation.

**ECON 262. Project Evaluation in Developing Countries (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The rationale for social benefit-cost analysis of projects in developing countries. Estimation of shadow prices to replace the distorted market prices in evaluating project profitability. The role of income distribution, externality, and uncertainty in project evaluation.

**ECON 264. Topics in Economic Development (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected themes for advanced study in economic development. Course is repeatable to a maximum of 8 units.

**ECON 265. Agricultural and Rural Development (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. This course is concerned with the economics of agricultural and rural development in developing countries. Topics examined include technical change, sharecropping and interlinked factor markets, migration, poverty and famine, land reform, environmental aspects of rural development, and structural adjustment within agriculture.

**ECON 266. The Political Economy of Imperialism (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examination of traditional and contemporary theories of imperialism, with attention to the origins and evolution of principal ideas and a critical assessment of their influence on developmental literature.

**ECON 268. Economics of Biotechnology (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing in Economics or in one of the biological sciences or consent of instructor. Covers the economic causes and consequences of revolutions in biotechnology. Topics may include the agricultural revolution, the Columbian exchange, and biotechnological advances in mechanization, brewing, and plant and animal breeding. Focuses on the implications of adopting genetically modified crops such as *Bacillus thuringiensis* corn and herbicide-resistant crops. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes.

**ECON 271. Radical Political Economy (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A survey of the methodology of radical political economy and an examination of its logical, empirical, and normative bases.

**ECON 272A. Political Economy: Marxian Economics (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A study of Marxian economic theory, including historical materialism, the role of value, class, exploitation, and accumulation in Marxian economics, and a survey of current debates on these issues.

**ECON 272B. Political Economy: Efficiency, Justice, and Power (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the various notions of efficiency used in political economic analysis, as well as their application in historical and comparative institutional contexts. Theories of justice in the distribution of rewards and the extent to which efficiency is separable from justice. Different notions of how power influences economic outcomes.

**ECON 272C. Political Economy: Comparative Political Economy (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores economic institutions and various methodological approaches to economics from a comparative perspective. Topics include types of capitalism (market-oriented, welfare-state, and the East Asian model), transitional economies, and market socialism. Institutional, socioeconomic, and radical political economy approaches to economic analysis are also discussed.

**ECON 279. Political Economy: Advanced Topics (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Topics in the methodology and theory of political economy. Course is repeatable to a maximum of 8 units.

**ECON 282 (E-Z). Advanced Macroeconomic Theory (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): passing grade on the Macroeconomic Cumulative Examination or consent of instructor. Covers advanced topics in macroeconomic theory. Students read state-of-the-art research papers and books. Includes presentations by students and faculty. E. Foundations of Macroeconomics; F. Advanced Monetary Theory; G. Special Topics in Macroeconomic

Theory. ECON 282G is repeatable to a maximum of 8 units.

**ECON 283 (E-Z). Advanced Microeconomic Theory (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): passing grade on the Microeconomics Cumulative Examination or consent of instructor; for ECON 283M, ECON 283N, ECON 283P, ECON 283Q, ECON 283R: ECON 200C. Covers advanced topics in microeconomic theory. Involves reading current research papers and books, and presentations by students and faculty. E. Rational Choice Theory; F. Measurement and Aggregation in Economics; G. General Equilibrium; I. Social Choice and Welfare; J. Uncertainty and Information; K. Special Topics in Microeconomic Theory; M. The Microtheoretic Bases of Development Economics; N. Applications of Games and Information Economics; O. Measurement of Productivity and Efficiency; P. Public Economic Theory; Q. Economics of Contract: Theory and Applications; R. Measurement of the Standard of Living, Inequality, and Deprivation. ECON 283K is repeatable to a maximum of 8 units.

**ECON 285 (E-Z). Advanced Econometrics (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): ECON 205A, ECON 205B, ECON 205C; or consent of instructor. Advanced topics and recent developments in econometrics. State-of-the-art research papers and books are read, and presentations are made by students as well as faculty. E. Advanced Econometric Methods; F. Topics in Econometrics; G. Applied Econometrics; I. Macroeconometrics; J. Nonparametric Econometrics; K. Microeconometrics. ECON 285F is repeatable to a maximum of 8 units.

**ECON 289. Colloquium in Economics (2)**

Seminar, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing. Lectures and discussion by students, faculty and invited scholars on specially selected topics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes.

**ECON 290. Directed Studies (1-6)**

Prerequisite(s): graduate standing and consent of instructor. Directed studies of selected problems of economic analysis. Open to graduate students who desire to do special work in a particular field. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ECON 291. Individual Study in Coordinated Areas (1-12)**

Outside research, 3-36 hours. A program of study designed to advise and assist candidates who are preparing for examination. Graded Satisfactory (S) or No Credit (NC). Repeatable as follows: (1) a student may take up to 12 units prior to the award of the M.A. (these 12 units do not count toward the required M.A. units); (2) a student may take up to 18 additional units after award of the M.A. but prior to successful completion of the Ph.D. qualifying examination.

**ECON 292. Concurrent Analytical Studies (2-4)**

Lecture, 1-3 hours; outside research, 6-12 hours. Prerequisite(s): consent of instructor. Each 292 course will be taken concurrently with some 100-series course, but on an individual basis. It will be devoted to completion of a graduate paper based on research or criticism related to the 100-series course. Faculty guidance and evaluation will be provided through the quarter. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**ECON 297. Directed Research (1-6)**

Prerequisite(s): graduate standing and consent of instructor. Directed research on selected problems in economics. Designed for graduate students who have not yet passed their qualifying examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ECON 299. Research for Thesis or Dissertation (1-12)**

Prerequisite(s): graduate standing and consent of instructor. Research in economics under the direction of a staff member to be included as part of the doctoral dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

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**ECON 302. Teaching Practicum (1-4)**

Practicum, 3-11 hours; seminar, 1 hour. Prerequisite(s): limited to department TAs; graduate standing. Supervised teaching in upper- and lower-division courses. Required of all economics teaching assistants. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

## Education

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**Subject abbreviation: EDUC**

**Graduate School of Education**

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Dougless E. Mitchell, Ed.D., Interim Dean,  
Graduate School of Education

Anne Jones, Ed.D., Assistant Dean, and  
Graduate Advisor, M.Ed., General  
Education Teaching Emphasis

Margaret Nash, Ph.D., Graduate Advisor

Robert Ream, Ph.D., Graduate Advisor  
1124 Sproul Hall

Graduate Program (951) 827-6362

Credential Programs (951) 827-5225

[education.ucr.edu](http://education.ucr.edu)

**Professors**

Janet B. Blacher, Ph.D.

Sharon A. Duffy, Ph.D.

V.P. Franklin, Ph.D. *President's Chair*  
(Education/History)

John S. Levin, Ed.D. *Bank of America Chair in*  
*Education Leadership*

George Marcoulides, Ph.D.

Douglas E. Mitchell, Ph.D.

Rollanda E. O'Connor, Ph.D. *Eady/Hendrick*  
*Endowed Chair in Learning Disabilities*

Melanie Sperling, Ph.D.

H. Lee Swanson, Ph.D. *Peloy Chair in Learning*  
*Disabilities*

**Professors Emeriti**

Irving H. Balow, Ph.D.

Steven T. Bossert, Ph.D.

Robert C. Calfee, Ph.D.

Jerry S. Carlson, Ph.D.

James T. Dillon, Ph.D.

Dan M. Donlan, Ph.D.

E. Mark Hanson, Ph.D.

Irving G. Hendrick, Ed.D.

Donald L. MacMillan, Ed.D.

Richard S. Newman, Ph.D.

Flora I. Ortiz, Ph.D.

Reba N. Page, Ph.D.

**Associate Professors**

Begoña Echeverria, Ph.D.

Margaret A. Nash, Ph.D.

Robert K. Ream, Ph.D.

Michael L. Vanderwood, Ph.D.

John S. Wills, Ph.D.

**Assistant Professors**

Natalie C. Becker, Ph.D.

Sara Castro Olivo, Ph.D., NCSP

Luciana N. Dar, Ph.D.

Marsha M. Ing, Ph.D.

Michael J. Orosco, Ph.D.

Gregory Palardy, Ph.D.

\*\*

**Cooperating Faculty**

Steven G. Brint, Ph.D. (Sociology)

Mary Gauvain, Ph.D. (Psychology)

**Director of Teacher Education Services**

Anne Jones, Ed. D.

## Graduate Program

General university requirements, such as residence and unit requirements, are in the Graduate Studies section of this catalog. *Policies and Procedures for Graduate Degree Programs* may be obtained from the Graduate Degree Program Office.

**Admission** Admission is based upon GPA and letters of recommendation from writers knowledgeable about the candidate's ability to succeed in graduate study. In addition, M.A. and Ph.D. applicants must submit scores from the GRE General Test (verbal, quantitative, analytical), no more than five years old from the date of their matriculation. Ph.D. applicants must submit a writing sample. The GRE is not required of applicants seeking admission to credential programs or to the M.Ed. program. The Ph.D. program admits students in the Fall quarter only.

### Master of Arts

Two types of M.A. degrees are available.

**Type A—Education** (with a cooperating department)

At present, 13 departments and programs cooperate with the Graduate School of Education in this program. They include Anthropology, Biology, English, French, Geological Sciences, Germanic Studies, History, Mathematics, Music, Political Science, Psychology, Sociology, and Spanish.

**Plan II (Comprehensive Examination)** Students must complete a minimum of 36 upper-division and graduate units, including a minimum of 18 units in Education and 18 in the cognate discipline. Baccalaureate level training in the cognate field is presumed. The candidate must pass comprehensive examinations in Education and the cognate field.

**Type B—Education**

Candidates enrolled in this program normally have completed an undergraduate major or its equivalent in a subject field other than education. General areas of specialization include Education, Society, and Culture, Educational Psychology, Special Education, and School Psychology (for students working toward the Ph.D.). Only students matriculating in a Graduate School of Education Ph.D. program may earn a concurrent, Type B, Education Masters degree in School Psychology (Plan I Thesis option only). Course requirements for the programs may be obtained from the Graduate Degree Program Office, 1124 Sproul Hall. Before the end of the first quarter, the student's advisor develops a program plan that specifies the courses the student will take.

The M.A. program gives students (with the exception of School Psychology students) the option of completing a thesis or taking a comprehensive written examination.

**Plan I (Thesis)** Students complete a minimum of 36 upper-division and graduate units. At least 24 of these units are in graduate courses. A maximum of 12 units may be in graduate research for the thesis.

At the beginning of the second, and generally not later than the third quarter of full-time work, candidates submit a plan for the thesis to their committee. Candidates also list courses to be taken for developing competence in their area of specialization. The plan is reviewed and approved by a committee of three faculty members. Upon completion of the thesis, the candidate submits it to this committee for approval. Upon successful completion of the thesis, the student is recommended to the Graduate Division for the M.A. degree.

**Plan II (Comprehensive Examination)** Students must complete a minimum of 36 quarter units in upper-division and graduate courses in Education and related fields as defined in existing programs. At least 18 of the 36 units must be in graduate courses, and none in graduate research for the thesis.

A faculty member from the program area specialization is appointed by the graduate advisor to guide the candidate. A program plan must be filed with the graduate advisor by the end of the first quarter of residency.

Upon or near completion of course work, the student applies to take a comprehensive written examination. Upon successful completion of the examination, the candidate is recommended to the Graduate Division for the M.A. degree.

**Normative Time to Degree** 6 quarters from admission to the M.A. program

### Master of Education

A Master of Education (M.Ed.) degree program is offered that allows students to select from six emphases. The GRE is not required for admission to the M.Ed. program. No thesis or comprehensive examination is required. Instead, students complete an analytical project that builds on course work and links educational theory and research with the dynamics of teaching, learning, and leadership.

**General Education Teaching Emphasis**

M.Ed. and California Teaching Credential in Multiple Subjects or Single Subject

This emphasis allows qualified students to complete requirements for a California teaching credential and a master's degree in one academic year and two summers.

Prospective students must submit an application to the Graduate Division.

Concurrent admission into the Multiple Subjects or Single Subject credential program is required for this emphasis. Students not admitted to the M.Ed. degree can be consid-

ered for credential only program. Those who already possess California teaching credentials are not eligible for this program but may apply for admission to the other graduate degree programs offered by the GSOE.

**Admission** The following are requirements:

1. A baccalaureate degree from an accredited institution
2. A minimum GPA of 3.2 based on the last 90 quarter units in the baccalaureate program
3. Passage of Basic Skills and Subject Matter Requirements
4. Three Letters of Recommendation
5. Official transcripts

**Course Work** This M.Ed. emphasis requires up to 72 units, 36 units are in upper division and graduate level courses; at least 18 of the 36 units must be completed in graduate level courses (Plan II). Students must successfully complete their credential requirements to earn the degree. This program requires courses that are taken during summer sessions.

**Analytical Project** The analytical project centers on comprehensive, critical self-analyses of instructional practice in K-12 classrooms. A final version of the analytical project is submitted to the Graduate School of Education in electronic form for faculty committee review.

### Special Education Teaching Emphasis

M.Ed. and California Education Specialist Credential

This degree emphasis is designed to provide a pathway to earn a California Education Specialist Mild/Moderate or Moderate/Severe disabilities teaching credential and Master of Education degree. The program goes beyond best practice by preparing students to critically evaluate the literature on current and future practices and can be completed in less than two years. The first year of course work is designed to meet the requirements for the teaching credential and includes courses that are not applied to the degree requirements.

**Admission** The following are requirements:

1. A baccalaureate degree from an accredited institution
2. Admission to the Education Specialist Credential program in Mild/Moderate or Moderate/Severe Disabilities
3. Submission of letters of recommendation and transcripts

Admission is based upon GPA and letters of recommendation from writers who are knowledgeable about the candidate's ability to succeed in graduate study.

**Course Work** This emphasis requires 36 units (at least 24 of which must be graduate level courses). Three of the following courses, required for teaching certification, can be applied to the master's degree if the courses were not applied to a previous degree:

EDUC116, EDUC120, EDUC129, EDUC130 or EDUC133.

**Analytical Project** Students will complete a final written project that integrates the content of theory and teaching methods courses. A final version of the report will be submitted to the Graduate School of Education and evaluated by faculty in the Special Education area.

### Autism Emphasis

This M.Ed. emphasis focuses on children with Autism Spectrum Disorder. A unique partnership between the Graduate School of Education and University Extension reflects a balance of research and theory from active researchers and relevant K-12 application knowledge from practitioners in the field.

**Admission** The following are requirements:

1. Teaching credential in general education or special education or admission to a UCR Specialist Level I Preliminary Credential program
2. Letters of Recommendation
3. Strong academic record

**Course Work** Required courses are offered in the Graduate School of Education, Summer Session, and University Extension. Some courses are offered only in GSOE, one course is offered only at Extension, and one course is offered in Summer Session. For some course requirements, students may choose from courses with comparable content in GSOE and Extension or Summer Session. A minimum of 36 units are required.

**Analytical Report** Students will complete a final written project that integrates the content of theory and teaching methods courses. A final version of the project will be submitted to the Graduate School of Education and evaluated by faculty in the Special Education area.

### Diversity and Equity Emphasis

This M.Ed. emphasis addresses the diversity in many K-12 student populations and supports teachers in achieving educational equity for all students through the translation of educational theory and empirical research findings into sound educational practice. It is a collaboration between the Graduate School of Education and University Extension and provides qualified students who have addressed issues of student diversity and equity in one of four Extension certificate programs (Reading; Reading with Biliteracy Emphasis; CLAD through CTCL; Education for the Gifted and Talented) opportunities to explore and study equity and diversity in greater depth and breadth through GSOE coursework. Students receive credit for up to 9 units of 400-level certificate courses.

**Admission** The following are requirements:

1. A teaching credential
2. Strong academic record
3. Letters of reference
4. Completion of one of four approved Extension certificate programs

**Course Work** This M.Ed. emphasis requires 37 units, 9 of which are in the 400-series professional courses offered by University Extension that satisfy requirements for one of four certificates relevant to equity and diversity. The remaining 28 units are in 200-series courses offered in GSOE.

**Analytical Report** Students will complete a final written project that integrates the content of courses taken to address a specific concern regarding diversity and educational equity in their classroom, school, or district. A final version of the project will be submitted to the Graduate School of Education and evaluated by faculty in the Education, Society, and Culture area.

### Higher Education Administration and Policy Emphasis

This M.Ed. emphasis examines scholarship and research on institutions, policy, systems, and demographic, historical, political, social, and economic contexts. It emphasizes reflective practice and prepares practitioners for careers in higher education institutions so that they can be knowledgeable scholars and expert professionals.

**Admission** The following are requirements:

1. A baccalaureate degree from an accredited institution
2. Career interests in a higher education setting
3. Three letters of recommendation from academic sources
4. Strong academic record, with an undergraduate GPA of at least 3.0

**Course Work** 36 units are required. The majority of courses are offered in the Graduate School of Education and focus on higher education, but program plans may also include relevant courses offered in other departments.

**Analytical Report** After students complete their course work they will complete a case study report that integrates content from higher education courses with practice.

A final version of the report is submitted to the Higher Education faculty committee in the Graduate School of Education for review and approval.

### Reading Emphasis

M.Ed. and Reading and Language Arts Specialist Credential

This emphasis is a collaboration between the Graduate School of Education and University Extension. It allows qualified students who are completing the requirements for a California Reading and Language Arts Specialist Credential, offered by University Extension, to concurrently earn an M.Ed. with a reading emphasis. Three courses required for the reading credential will be credited toward both the credential and the M.Ed. Two courses are offered during Summer Session.

To be considered for this M.Ed. emphasis, prospective students must have K-12 teaching experience and first be admitted to the

Reading and Language Arts Specialist program offered through University Extension. Students must apply to the M.Ed. program before completing the Specialist credential.

**Admission** The following are requirements:

1. A teaching credential
2. 3 years teaching experience
3. Admission to Reading and Language Arts Specialist program
4. Submission of letters of recommendation and transcripts

Admission is based upon GPA and letters of recommendation from writers knowledgeable about the candidate's ability to succeed in graduate study.

**Course Work** This M.Ed. emphasis requires 37 units, 9 of which are in the 400-series professional courses offered by University Extension that satisfy requirements for the Reading and Language Arts Specialist credential and are offered by University Extension. The remaining 28 units are in 200-series courses. Two courses will be offered only during Summer Session. The Reading and Language Arts Specialist credential requires additional units that are not part of this M.Ed. curriculum.

**Analytical Report** Students are given a case study to examine and develop a reading intervention and plan for implementation and assessment. A final version of the case study report is submitted to the Graduate School of Education for faculty committee review.

## Doctoral Degree

The doctoral program in Education is designed to prepare scholars for teaching and research in the area of education. More information about graduate programs in Education, contact the graduate advisor, Graduate School of Education, (951) 827-6362, or visit [education.ucr.edu](http://education.ucr.edu).

**Admission** Admission is based on strong academic preparation at the baccalaureate level and a master's degree in education such as that offered at UCR or a master's degree in an ancillary field. Doctoral students begin their programs in the fall quarter.

**Specialization** General areas of specialization include Education, Society, and Culture, Higher Education Administration and Policy, Special Education, Educational Psychology, and School Psychology. The School Psychology Program is accredited by the American Psychological Association (APA) and approved by the National Association of School Psychologists (NASP). School Psychology Ph.D. students can also obtain a Pupil Personnel Services Credential.

Following admission to the program, students are assigned a preliminary faculty advisor who guides them during the initial phase of their program. Students work closely with a faculty advisor during their doctoral program. In addition, three faculty committees — a program guidance committee, an oral qualifying examination committee, and a dissertation committee — are formed at various stages of the program.

**Course Work** In the first year of the program students in all areas except School Psychology take a year-long methodology sequence in which students examine the nature of inquiry and uses of qualitative and quantitative research methods in education. All students take specialized area seminars in the first year.

Students may take additional specialization courses during the first year.

During the next phase of the program, students pursue in-depth studies in at least two fields of concentration. Normally, the student and a three-member program guidance committee identify and document a program plan for the remaining course work in these areas. Preparation in each field consists of sufficient study to allow the students to grasp the essential concepts and inquiry methods of that field.

**Qualifying Examination** After or near completion of course work in the second phase and before being advanced to candidacy, the student must pass written and oral qualifying examinations. The student's faculty advisor, in consultation with faculty associated with the student's area of specialization, coordinates the construction of the written examination. Students must

1. Review critical literature in an assigned field
2. Demonstrate competence in research methodologies, and
3. Demonstrate competence over content in fields of specialization.

The faculty associated with the student's area of specialization evaluate the written qualifying examination. Following the written examination and before the oral qualifying examination, the Graduate Dean appoints an oral qualifying committee consisting of the student's faculty advisor, three additional faculty members from the Graduate School of Education, and one faculty member from outside the school.

**Pre-proposal** In preparation for the oral qualifying examination, students develop a pre-proposal, setting forth the direction of their dissertation. Once the faculty advisor determines that the pre-proposal is ready for the oral examination, it is distributed to the oral qualifying committee. The committee uses the pre-proposal as a focus for examining the student, but the questioning may go beyond the pre-proposal. Students pass the oral qualifying examination when the committee is satisfied that 1) the pre-proposal, as well as the student's grasp of the theoretical and empirical issues at its core, leads in a productive direction toward a competent dissertation, and 2) the student has demonstrated competence in areas covered by the written examination that are also addressed in the oral examination. Students in the School Psychology program must complete and pass the oral qualifying examination before starting the required 1500-hour internship.

**Teaching Requirement** Determined by the student's program guidance committee.

**Foreign Language Requirement** None

**Dissertation** Prior to commencing the dissertation research, students must have a dissertation proposal approved by the dissertation committee. Following completion of the dissertation, the chair of the candidate's committee schedules an oral defense. The dissertation must meet with the approval of the dissertation committee and the Graduate Council before the candidate is recommended for the degree.

**Normative Time to Degree** 15 quarters from admission to the Ph.D. program

## Credential Programs

The Graduate School of Education offers teaching credential programs, and a credential for school psychologists. These programs are accredited by the California Teaching Commission.

**Admission** to GSOE credential programs is based upon GPA and letters of recommendation from individuals knowledgeable about the candidate's ability to succeed in professional study. Most programs also require an interview. Admission to the teaching credential programs also requires candidates to pass exams in basic skills and subject matter. Course prerequisites depend on the intended program. More information regarding the prerequisites is available on the Prepare to Teach flyer. Admission information and deadlines are available at [www.education.ucr.edu](http://www.education.ucr.edu). Contact GSOE at (951) 827-5225 or at [creded@ucr.edu](mailto:creded@ucr.edu). Information can also be obtained at the GSOE Student Services Office, 1124 Sproul Hall.

## Programs for the Preparation of Teachers

### Post baccalaureate Teaching Credential Programs

The Graduate School of Education offers credential programs that result in teacher certification and do not require admission to a master degree program. The following programs are offered:

- **Multiple Subjects** Generally for the elementary setting. A bilingual emphasis in Spanish is available to qualified candidates who want to be authorized to deliver instruction in Spanish as well as English.
- **Single Subject** Generally for the middle school or high school setting. GSOE offers the following single subject areas: English, Languages Other than English, Mathematics, Sciences, and Social Science.
- **Education Specialist** For those who want to be special education teachers. GSOE offers the following specializations: Mild/Moderate or Moderate/Severe Disabilities.

All credential programs offer the option of student or intern teaching. The intern option requires candidates to have some teaching experience (ex: substitute teaching or instructional aides) and completion of pre-service requirements prior to admission.

Combined teacher credential programs with a Master of Education degree (M.Ed.) are described in the Master of Education section.

## Lower-Division Courses

**EDUC 001. Imagining Teaching (2)** Lecture, 2 hours. Prerequisite(s): none. Considers images of teaching produced in popular culture, professional writing, and personal recollections, and how the images impact and reflect teaching in schools. Designed for lower-division students considering teaching as a career. Credit is awarded for only one of EDUC 001 or EDUC 003.

**EDUC 002. Looking in Classrooms (3)** Lecture, 2 hours; field, 3 hours. Prerequisite(s): EDUC 001 or EDUC 003. Involves observation in classrooms in local schools identified as having exemplary programs. Students record and interpret their observations and compare them to published studies of classrooms. Credit is awarded for only one of EDUC 002 or EDUC 004.

**EDUC 003. Imagining Teaching: Science/Mathematics Emphasis (3)** Lecture, 2 hours; field, 3 hours. Prerequisite(s): admission to the California Teach program; consent of instructor. Considers images of teaching produced in popular culture, professional writing, and personal recollections, and how the images impact and reflect teaching in schools. Addresses topics related to teaching mathematics and science in the K-12 classroom. Includes 3 hours per week of participation and observation in public school classrooms. Designed for lower-division students who plan to teach mathematics or science in the public schools. Credit is awarded for only one of EDUC 001 or EDUC 003.

**EDUC 004. Looking in Classrooms: Science/Mathematics Emphasis (3)** Lecture, 2 hours; field, 3 hours. Prerequisite(s): EDUC 003; admission to the California Teach program; consent of instructor. Involves observation in classrooms in local schools identified as having exemplary programs in mathematics and science. Students record and interpret their observations and compare them to published studies of classrooms. Designed for lower-division students who plan to teach mathematics or science in the public schools. Credit is awarded for only one of EDUC 002 or EDUC 004.

**EDUC 044. Principles of Healthful Living (4)** Lecture, 3 hours; outside research, 3 hours. Introduction to personal, family, and community health. Discusses the attitudes and behaviors associated with healthful living and the use of health-related scientific information. Explores the effects of alcohol, dangerous drugs, narcotics, degenerative and infectious diseases, and tobacco on the human body and the community resources available to assist in their treatment.

## Upper-Division Courses

**EDUC 100A. Tutorial Teaching: Community Outreach (2)** Lecture, 5 hours per quarter; field, 3 hours; outside research, 15 hours per quarter. Prerequisite(s): upper-division standing. Motivation and teaching of children and adolescents in a tutorial setting in a school or other appropriate community educational center. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

**EDUC 100B. Tutorial Teaching: Professional Development (2)** Lecture, 5 hours per quarter; field, 3

hours; outside research, 15 hours per quarter. Prerequisite(s): upper-division standing; consent of instructor. Guided and sequenced tutorial experiences with children and adolescents enrolled in local schools having cooperative arrangements with the University. Provides experience in one-on-one teaching and supports the professional development of students planning to teach. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

**EDUC 101. Academic Disciplines and Professional Education (1)** Lecture, 1 hour. Prerequisite(s): upper-division standing. An introductory study of how academic disciplines relate to pedagogy. Includes developing a personal educational philosophy, discovering ways to communicate knowledge, and reflecting on how a scholar becomes a teacher. Designed for undergraduates considering education as a professional career. Graded Satisfactory (S) or No Credit (NC).

**EDUC 104. Mathematics Education (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): sophomore, junior, or senior standing. Examines contemporary instructional strategies relating to mathematics education. Includes thinking skills and problem solving strategies applicable to number theory, logic patterns and functions, statistics, probability, and geometry and algebra. Cross-listed with MATH 104.

**EDUC 109. Education in a Diverse Society (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing. An analysis of the classroom as a microcosm of society. Focuses on issues related to meeting the educational needs of students with diverse backgrounds and characteristics including gender, religion, ability, ethnicity, culture, socioeconomic status, class, and language.

**EDUC 110. Learning Theory and Psychology in Education (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers the study of stages of intellectual development; principles of learning; the dynamics of human behavior; learner and cultural differences as they relate to modern curricula and instruction; and the role of motivation and self-concept in the learning process.

**EDUC 114. Comparative International Education (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Identification, analysis, and comparison of the educational characteristics of selected developed and developing nations such as Japan, England, Mexico, and Egypt.

**EDUC 116. The Exceptional Child (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing. Explores characteristics of individuals with physical and mental disabilities. Includes emotional disturbance, visual or hearing impairments, gifted and talented students, and children with characteristics of autism. Emphasizes educational programs and considers the effect of gender, socioeconomic, ethnic, and linguistic factors.

**EDUC 120. Guidance in Special Education (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): EDUC 116 or consent of instructor. Application of principles and techniques of counseling children with disabilities and their families or guardians. Emphasizes the role of the teacher in educational, personal, and vocational (transition) guidance for exceptional children. Includes materials for working with families from diverse cultural and linguistics backgrounds.

**EDUC 129. Educational Assessment of Individuals with Disabilities (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 116 or consent of

instructor. Principles and techniques of assessment and educational planning for children with disabilities. Includes examination of a broad range of assessment tools for general and special education.

**EDUC 130. Mild and Moderate Disabilities (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): EDUC 116 or consent of instructor. Explores characteristics, etiology, and identification of individuals with mild and moderate disabilities, history and laws influencing their treatment and education, and current education and transition issues. Includes mild and moderate retardation, learning disabilities, and emotional and behavioral disorders.

**EDUC 131. Moderate and Severe Disabilities (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): EDUC 116 or consent of instructor. Explores characteristics, etiology, and identification of individuals with moderate and severe disabilities, history and laws influencing their treatment and education, and current education and transition issues. Includes mental retardation, serious emotional disturbance, and autism.

**EDUC 133. Issues and Trends in Special Education (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): EDUC 116. Covers characteristics, etiology, and identification of students with disabilities. Includes history and laws influencing treatment, education, and transition to adulthood; issues related to labeling, eligibility, and program placement; changes in educational interventions based on research and law; services to pre-school age children and their families; and trends in instructional approaches. Satisfactory (S) or No Credit (NC) grading is not available.

**EDUC 139. Curriculum and Instruction (4)** Lecture, 3 hours; laboratory, 2 hours; outside research, 1 hour. Prerequisite(s): upper-division standing. The study of modern curricula in the elementary and secondary schools, including the effects of performance objectives, diagnostic-prescriptive teaching, individualized instruction, lesson planning, and performance assessment. Content analysis of curriculum areas will be emphasized.

**EDUC 146. Educational Perspectives on the Chicano (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): consent of instructor. An examination of educational policy issues concerning Chicano students, such as testing and testing procedures, learning styles, socialization, and language acquisition. Other topics will deal with the impact of significant legislative acts related to the education of Chicanos. Cross-listed with ETST 146.

**EDUC 150. Teacher Education Lecture Series (1)** Lecture, 10 hours per quarter. Prerequisite(s): upper-division standing. Presentations, demonstrations and discussions on timely topics in public school teaching. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

**EDUC 172. Reading and Language Development (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing; consent of teacher education advisor; ability to meet safety and health clearance standards for a public school district. An introduction to reading and language development. Addresses theoretical models of reading; linguistics and language development; methods and materials; children's and adolescents' literature; reading in the content areas; individual differences; and measurement and evaluation in reading. Includes observation and participation in assigned schools.

**EDUC 173. Teaching Literature to Children and Adolescents (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing.

Explores developmental methods appropriate for teaching literature to children and adolescents. Topics include story telling, story reading, pictorialization, dramatics and body movement, and narrative, poetic, and dramatic writing. Examines literature written for children and adolescents and adult fiction appropriate for children and adolescents.

#### **EDUC 174. Reading and Writing in the Content**

**Areas (5)** Lecture, 3 hours; field, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing; consent of teacher education advisor; ability to meet safety and health clearance standards for a public school district. An examination of reading, writing, and study skills needed by elementary and secondary students in all content areas of the curriculum. Includes observation and participation in assigned schools.

#### **EDUC 177A. Language Development in Content**

**Areas (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing. A study of second language acquisition and models of teaching strategies for English language development in content area instruction. Satisfactory (S) or No Credit (NC) grading is not available.

#### **EDUC 177B. Language Development in Content**

**Areas (3)** Lecture, 2 hours; field, 2 hours; outside research, 1 hour. Prerequisite(s): EDUC 177A. Analysis, planning, execution, and evaluation of empirical and theoretical foundations of programs and strategies for English-as-a-second-language instruction and English language development in content area instruction. Includes observation and participation in assigned schools. Satisfactory (S) or No Credit (NC) grading is not available.

**EDUC 190. Special Studies (1-5)** Outside research, 3-15 hours. Prerequisite(s): upper-division standing; consent of the Dean of the Graduate School of Education. Independent study and research in education. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

## Graduate Courses

**EDUC 200. Human Differences (4)** Lecture, 3 hours; research, 3 hours. Prerequisite(s): EDUC 212 or equivalent. Covers dimensions of individual differences, varieties of group differences, and factors producing differences in development.

#### **EDUC 201A. Research in Reading and Writing (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A critical evaluation of linguistic, cognitive, social, and cultural aspects of reading and writing, as gleaned from research, and reading and writing research methods.

#### **EDUC 201B. Theories and Issues in Literacy (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 201A or consent of instructor. Examination of literacy development in individuals and in society; definitions of literacy; development of structural knowledge; development of communication skills; role of language differences in the problems of learning to read and write; oral language arts; emergent literacy; and writing development.

**EDUC 202. Theories of Education (4)** Lecture, 3 hours. Prerequisite(s): consent of instructor. An analysis of the principal contemporary theories affecting the development of educational policy.

**EDUC 203. History of American Education (4)** Lecture, 3 hours. Prerequisite(s): consent of instructor. A study

of American educational history from 1830 to the present.

**EDUC 204. The School as a Social System (4)** Lecture, 3 hours. A study of intra-school relationships; administration, professional bureaucracy, faculty and student relations. The classroom itself will be examined as a social-psychological system.

**EDUC 205. School-Community Relations (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the structures of communication that help shape the relationships between schools and their communities. Emphasis given to an analysis of communication processes and techniques to improve community support, parent participation, and private sector partnerships.

#### **EDUC 206A. Politics of Education: Local School**

**District (4)** Lecture, 3 hours. Examination of political power, representation, influence, decision-making and inter-governmental relations in the public schools.

#### **EDUC 206B. Advanced Seminar on Federal and State**

**Policy (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 207 or EDUC 209A or EDUC 209B or consent of instructor. Examines state and federal roles in education policy in K-12 education. Focuses on the role of federal and state policy in defining governance and teaching and learning in schools.

**EDUC 207. Educational Policy (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines twentieth-century American educational policy covering major issues underlying school reform and the social, political, and economic forces that shape these issues. Also examines state and local strategies to enhance school performance.

#### **EDUC 208. Legislative Action and Educational**

**Policy (4)** Lecture, 4 hours. Examination of the legal processes governing educational policy, including significant laws, legal principles, recent litigation, controlling relationships of schools to student and teacher rights and duties, administrative behavior, etc. Focuses on connections between legislative and judicial action and the social, political and economic forces affecting education.

**EDUC 209A. Education Policy Analysis (4)** Lecture, 3 hours. Prerequisite(s): consent of instructor.

Theoretical and methodological foundations for education policy analysis. Focuses on theory building—utilizing frameworks from political science, sociology, social psychology, and history.

**EDUC 209B. Education Policy Analysis (4)** Lecture, 3 hours. Prerequisite(s): consent of instructor.

Theoretical and methodological foundations for education policy analysis. Examines conceptualization of variables and the formulation and testing of hypotheses regarding policy formation and effects.

**EDUC 210. Issues in Teacher Education (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): enrollment in an M.A. or Ph.D. program. Analyzes research, policies, and practice in teacher education. Examines key issues such as the role of teacher education, major reform efforts, and alternative teacher certification.

**EDUC 211A. Cognitive Development (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Survey course on children's cognitive development and the application of cognitive-developmental theory (Vygotsky, Piaget, information processing) and

research to children's learning and academic achievement.

**EDUC 211B. Social Development (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys social development during childhood and adolescence. Topics include individuality and self, peer relations, adult-child relations, self-system beliefs and attitudes, and achievement motivation. Special attention is paid to issues as they relate to socialization at school.

**EDUC 212. Research Methods (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers principles of scientific research, including historical, survey, descriptive, correlational, and experimental and quasi-experimental methods, as well as internal and external threats to validity.

**EDUC 213. Factor Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 242A or consent of instructor. Covers theory and practice of factor analysis in educational and psychological measurement. Addresses exploratory and confirmatory factor analytic strategies. Includes application of computers to computation in factor analysis.

#### **EDUC 214. Educational Research: Statistical Inference**

**and Hypothesis Testing (5)** Lecture, 3 hours; laboratory, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 241C or consent of instructor. Covers sampling distributions and their use in tests of significance; ANOVA; planned multiple comparisons; fixed, random, and mixed-effects models; and simple and multiple regression. Examples are from education.

#### **EDUC 215. Educational Research: Experimental**

**Design (5)** Lecture, 3 hours; laboratory, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 214. Focus is on common designs used in education, including higher order factorials, hierarchical designs, and repeated measures. Emphasis is on design application and appropriate statistical analysis for education. Covers ANCOVA.

#### **EDUC 216. Educational Research: Advanced**

**Statistics (5)** Lecture, 3 hours; laboratory, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 214, EDUC 215. Study of advanced statistical procedures frequently used in educational research. Topics vary. Covers MANOVA, simple and multiple regression, discriminant function analysis, and factor analysis.

#### **EDUC 217. Single-Case Experimental Design (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; or consent of instructor. Covers the logic, applications, and analytic techniques for single-case experimental designs in naturalistic settings. Specific designs include withdrawal, multiple baseline, alternating treatments, changing criterion, and multielement experimental designs. Emphasizes problems of using and changing single-case experimental designs in applied settings.

**EDUC 218. Problems in Evaluation (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. A study of policies and procedures that define program evaluations in education. Topics include evaluation models, formative and summative strategies, evaluation designs and analyses, and ethical issues.

#### **EDUC 219. Classroom and School Assessment (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Survey course in classroom and school assessment. Covers basic principles of measurement

including test administration, construction, scaling, norming, reliability, validity, and interpretation of individual and group tests.

**EDUC 220A. Sociocultural Theory and Education (4)** Seminar, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Explores sociocultural perspectives in relation to teaching, learning, students, teachers, and others in schools and other learning environments. Considers issues of knowledge, skills, values, power, and privilege as seen through sociocultural theory and research.

**EDUC 220B. Sociocultural Theory and Education (4)** Seminar, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): EDUC 220A or consent of instructor. Continues the exploration of sociocultural perspectives in relation to teaching, learning, students, teachers, and others in schools and other learning environments. Considers issues of knowledge, skills, values, power, and privilege as seen through sociocultural theory and research.

**EDUC 221. Technology in K-12 Education (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces computers and related technologies in education. Participants examine educational software and the Internet; explore pedagogical issues raised by technology use for students, teachers, and administrators; and consider how technology may facilitate changes in teaching and learning. Includes hands-on work and individual and group projects.

**EDUC 222. Role Formation in Educational Organizations (4)** Lecture, 3 hours. Prerequisite(s): consent of instructor. An analysis of adult roles and their formation in schools, e.g., teacher, counselor, principal and central office administrators. Emphasis will center on the individual's early socialization to the school's professional work and related professional ideologies.

**EDUC 223A. Qualitative Research Methodologies in Education (5)** Seminar, 3 hours; outside research, 6 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the theoretical underpinnings of qualitative research methodologies and their use in designing, conducting, and representing research.

**EDUC 223B. Qualitative Research Methodologies in Education (5)** Seminar, 3 hours; outside research, 6 hours. Prerequisite(s): graduate standing or consent of instructor; EDUC 223A. Focuses on the collection, analysis, and representation of data in interpretive research.

**EDUC 224. Organization and Administration of the School (4)** Lecture, 3 hours. The study of school systems and administrative roles in the light of organizational and administrative theory.

**EDUC 225. School Finance (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): consent of instructor. Explores methods of financing public education. Identifies budgeting and accounting techniques used by school districts in support of the instructional process and considers legal requirements and public reactions to the financing of education.

**EDUC 226. Dimensions of Exceptionality (4)** Lecture, 3 hours; research, 3 hours. Prerequisite(s): EDUC 116 or equivalent. An examination of exceptionality with particular emphasis on characteristics (general and specific developmental disabilities such as mental retardation and hyperactivity) and manifestations (in home, school, or alternative living environments). Focuses on identifying and intervening with children who have disabilities.

**EDUC 227. Educational Change and Innovation (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The study of change and innovation in the public school. Emphasis is placed on (a) the organizational environment of the school which must accommodate the innovation, (b) specific strategies of change, and (c) contemporary educational innovations.

**EDUC 228. Human Resources Administration in Education (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): consent of instructor. Examines theory, research, and practices associated with the human resources function in schools. Topics include goals, policies, and outcomes related to planning, recruitment, selection, appraisal, compensation, development, collective bargaining, and the use of management information systems as tools for informed decision making.

**EDUC 229. Leadership in School Organizations (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Examines theories of leadership in school organizations. Emphasis given to rational and institutional perspectives and their implications for management in educational settings.

**EDUC 230A. Curriculum Theory and Praxis in Education (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): consent of instructor. Covers analysis of curriculum theories, trends, innovations, and instructional strategies.

**EDUC 230B. Curriculum Theory and Praxis in Education (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 230A recommended. Covers analysis of curriculum organization, design, and implementation.

**EDUC 231 (E-Z). Special Problems in Curriculum and Instruction (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 139 or equivalent. Special problems in the curriculum area as follows: E. Curriculum Inquiry; G. Excellence in Teaching; M. Multicultural Programs in Reading and Language Arts; Q. Questioning and Teaching.

**EDUC 232. Teaching Strategies (4)** Lecture, 3 hours. Prerequisite(s): teaching credential, teaching experience. Development of varied instructional strategies and skills, such as inquiry and questioning, that are compatible with new and evolving curricula. Emphasis will be on classroom applications.

**EDUC 233. Differential Achievement and the School Learning Environment (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing. Explores how racial, ethnic, linguistic, cultural, and socioeconomic differences in educational achievement are a product of the learning environments experienced in schools and classrooms.

**EDUC 234. Multilevel Modeling (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 216 or consent of instructor. Covers the processes involved in conceptualizing, conducting, interpreting, and composing multilevel analyses. Includes ANOVA and ANCOVA with random effects, means-as-outcomes, random-coefficients, intercepts and slopes as outcomes, and growth models. Also addresses model building and assessment, centering, estimation, hypothesis testing, contextual and compositional effects, and other related topics.

**EDUC 235. Classroom Processes (4)** Lecture, 3 hours; consultation, 1 hour. Analysis and synthesis of theoretical and empirical studies of selected classroom processes, including question-answer exchanges and discussions.

**EDUC 236. School and Society (4)** Lecture, 2 hours; outside research, 6 hours. Prerequisite(s): first-year standing in the Ph.D. program in Education or second-year standing in the Ph.D. program in School Psychology. Introduces theories and research on societal, institutional, and organizational influences on schooling. Locates the work of educational professionals in the contexts of the school and the state.

**EDUC 237. Research on Teaching (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Examines approaches to research on teaching. Considers the process-product, classroom ecology, ethnographic, and teacher cognition paradigms.

**EDUC 238. Education and Gender (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the multiple and complex relationships of gender and education in U.S. society. Analyzes theoretical perspectives on gender and schooling. Topics include cultural constructions of identity, male and female experiences of schooling, and concepts of gender neutrality in the curriculum.

**EDUC 239. Developmental Psychopathology (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing in Education or Psychology or consent of instructor. Examines the origins of psychopathology from multiple theoretical perspectives with a specific focus on childhood disorders. Topics include biological and environmental contributions to disorder development and treatment paradigms.

**EDUC 240. Educational Psychology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 110 or equivalent or consent of instructor. Overview of the major empirical and theoretical bases of educational psychology, followed by detailed analysis of the following topics: (a) cognition and metacognition as applied to school learning and instruction, (b) motivation, student perceptions, teacher perceptions, classroom processes, (c) effective teaching, and (d) evaluation.

**EDUC 241A. Inquiry and Research Methods (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): first-year standing in the Ph.D. program in Education. Examines the nature of inquiry and research in educational studies, including the formation of questions.

**EDUC 241B. Introduction to Qualitative Methods (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 241A; first-year standing in the Ph.D. program in Education. Introduces qualitative research studies. Covers the design, collection, analysis, and interpretation of qualitative data in educational research.

**EDUC 241C. Introduction to Quantitative Methods (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 241A; first-year standing in the Ph.D. program in Education. Introduces quantitative research studies. Covers the design, collection, analysis, and interpretation of quantitative data in educational research.

**EDUC 242A. Educational and Psychological Measurement and Evaluation (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 214; consent of instructor. Examines topics in measurement and evaluation including classical test theory and program evaluation design. Focus is on application in educational and psychological settings and critical examination of norm-referenced and criterion-referenced testing.

**EDUC 242B. Advanced Educational and Psychological Measurement and Evaluation (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 242A or

equivalent or consent of instructor. Examines advanced topics in measurement and evaluation including generalizability theory and item response theory. Emphasis is on the statistical basis of these theories and their application in educational and psychological settings.

**EDUC 243. Student Metacognition and Self-Regulated Learning (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines theoretical perspectives and research approaches for studying students' metacognition and self-regulation and instructional interventions that can foster and support metacognition and self-regulation in children and adults in the areas of mathematics, reading and writing, and science.

**EDUC 244. The Student (4)** Lecture, 2 hours; outside research, 6 hours. Prerequisite(s): first-year standing in the Ph.D. program in Education. Focuses on the student population of today's schools through an analytical review of literature on human development, exceptionality, educational psychology, and policy. Students write an in-depth literature review and compose essays on critical research topics.

**EDUC 245 (E-Z). Review of Research Literature in Education (4)** for hours and prerequisites, see segment descriptions. Critical analyses of research in the various areas of education.

**EDUC 245E. History of Church, State, and Schooling (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Overview of the historical roles of religion in the origins and development of public schooling in the United States and the establishment of private religious schooling. Examines the historical roots of contemporary issues of schooling, church, and state, including school prayer, creationism and evolution debates, and censorship.

**EDUC 245G. The Opportunity/Achievement Gap (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines theoretical and empirical research on the "achievement gap" from a variety of social science disciplines. Explores causes and consequences of racial or ethnic, linguistic, cultural, and socioeconomic differences in educational achievement.

**EDUC 246 (E-Z). Research on Education of Exceptional Children (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 116 or equivalent; graduate standing or consent of instructor. Intensive study of current research on the education of exceptional children. E. Asperger Syndrome; F. Emotional and Behavior Disorders; G. Mild Mental Retardation; I. Learning Disabilities; J. Contemporary Issues and Trends; K. Autism Spectrum Disorders; L. Behavioral Phenotypes; M. Multicultural Special Education; N. Children At Risk; O. Family Influences on Development; P. Law, Policy, and Administration; R. History of Special Education; S. Sources and Treatments of the Reading Difficulties of Students with Disabilities.

**EDUC 247. Theoretical Perspectives on Learning (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on how learning occurs according to various theories and what factors may facilitate or impede learning. Theories include behaviorism, social learning theory, constructivism, information processing, social constructivism, sociocultural perspectives, and cultural and linguistic theories.

**EDUC 248 (E-Z). Higher Education (4)** For hours and prerequisites, see segment descriptions. A selection of courses for studies on higher education.

**EDUC 248E. Demographics and Diversity in Higher Education (4)** Seminar, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to theoretical perspectives of diversity in U.S. higher education. Explores the implications of demographic shifts on U.S. postsecondary educational practice and policy. Reviews the research literature on the impact of diversity on educational outcomes for college students, faculty, and administrators.

**EDUC 248F. Financing Higher Education (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of finance and economics of higher education in the United States. Examines economic theories as they apply to higher education finance and the distributive implications of various financing strategies. Covers main trends and current debates and how to identify political-economic rationales behind financing policy choices in higher education.

**EDUC 248G. Higher Education Governance (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to the organization and governance of higher education. Covers diverse forms of organization and governance in contemporary public and private higher education in the United States. Also addresses alternative theoretical frames through which to view postsecondary governance structures (both internal and external to institutions).

**EDUC 248-I. Critical Issues in Higher Education (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines internal and external issues that face higher education institutions.

**EDUC 248J. Higher Education Policy (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces a range of contemporary higher education policy issues and the conceptual and theoretical frameworks used to understand these issues. Develops fluency in using public policy language in the higher education setting. Addresses critical understanding of policy analysis, economics, and political science papers in higher education.

**EDUC 248K. The Dissertation and the Proposal in Higher Education (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Enhances skills in evaluating and critiquing research through written and oral communication. Includes completion of dissertation proposal in the field of higher education.

**EDUC 248M. The Community College (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analyzes current literature on community colleges.

**EDUC 248N. Higher Education Scholarship and Literature Review (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Utilizes scholarship in higher education to review literature on specific topics in the field, as well as develop these topics for research.

**EDUC 248-O. Organization and Administration in Higher Education (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines theory, research, and literature on higher education organizations and their management.

**EDUC 248P. Historical Perspectives on Campus Life (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines historical perspectives on cam-

pus life in the United States from the view of the students, faculty, administrators, and employees. May address the general environment, curriculum, student activities and clubs, athletics, town-gown relationships, or other aspects.

**EDUC 248Q. Foundations of Student Services (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the field of student services and student affairs in higher education institutions. Focuses on the historical and philosophical foundations of the field, as well as guiding theories and models of practice. Addresses contemporary challenges for student services practitioners.

**EDUC 248R. College Student Development (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Addresses student development in higher education institutions. Focuses on developmental theories applicable to college students. Examines institutional behaviors and actions (including policy) related to student development.

**EDUC 248S. The College Student (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analysis of current literature on diverse populations of students in colleges and universities. Examines contextual and personal factors shaping the college experience. Focuses on students' multiple identities and challenges.

**EDUC 248U. History of Higher Education in the United States (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Overview of the growth and development of institutions of higher learning in the United States, from the colonial colleges to the multipurpose research institutions of today, including academies, community colleges, and professional schools.

**EDUC 249. Discourse Analysis for Education (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analysis of spoken discourse in classrooms and other learning contexts to study social, cognitive, political, and historical aspects of teaching and learning; teacher-student relationships; schooling; and literacy acquisition. Topics include speaker-listener relationships, the social construction of educational roles, and discourse indicators of student development.

**EDUC 250. Seminar in Education (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. A series of presentations by guests, faculty, and advanced graduate students on selected topics in education. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EDUC 251. Seminar in Cognitive Development (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 211A or equivalent or consent of instructor. Seminar on current issues in cognitive development. Topics include metacognition, Vygotskian theory, and cultural factors in cognitive development. Special attention will be paid to issues as they relate to the learning and teaching of school subjects.

**EDUC 252 (E-Z). Seminar in Educational Psychology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): for EDUC 252N: EDUC 211A; consent of instructor. Reviews various topics in educational psychology at the theoretical and empirical levels. E. History of Educational Psychology; G. Advances in Mental Measurement; N. Children's Mathematical Cognition.

**EDUC 253. Advanced Doctoral Seminar in School Psychology (1 or 2)** Seminar, 10-20 hours per quarter.

Prerequisite(s): second-year standing in the Ph.D. program in School Psychology or consent of instructor. Covers current topics relevant to research and practice in school psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**EDUC 254A. Cognitive Assessment for School Psychologists (4)** Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or consent of instructor. Covers the administration, scoring, and interpretation of individual measures of intelligence and academic aptitude. Emphasizes the use of these measures for screening and classification decisions, as well as psychological report writing.

**EDUC 254B. Academic Assessment (4)** Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; or consent of instructor. Covers the administration, scoring, and interpretation of individual norm-referenced measures of academic achievement, perceptual-motor skills, and adaptive behavior. Emphasizes the use of these instruments for screening and classification decisions, as well as psychological report writing.

**EDUC 254C. Social, Emotional, and/or Behavioral Assessment (4)** Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; or consent of instructor. Covers procedures and techniques of behavioral assessment, including systematic behavioral observations, curriculum-based assessment, behavior rating scales, behavioral interviews, and self-monitoring. Includes conceptual issues in applying traditional psychometric theories to behavioral assessment data, as well as methods for integrating multimodal behavioral assessment information.

**EDUC 255A. Principles of Social Behavior Intervention (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; or consent of instructor. Covers the principles and procedures for developing social competencies in school-age children and youth. Topics include social skills assessment, sociometric assessment, and strategies for promoting acquisition, performance, and maintenance of social skills.

**EDUC 255B. Principles of Academic Behavior Intervention (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; or consent of instructor. Covers the principles and procedures for prevention and remediation of academic learning problems and performance. Topics include functional analysis, stimulus control, generalization, and methods for summarizing trends in academic performance.

**EDUC 255C. Child Behavior Therapy (4)** Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; or consent of instructor. Covers principles derived from neobehavioristic and social learning theories applied to treat children's problems. Discusses professional ethics, practice, and responsibility in clinical child behavior therapy.

**EDUC 256. Advanced Seminar in Learning Disabilities (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 212 or equivalent or consent of instructor. Critical evaluation of theory and research in the field of learning disabilities. Requires a data-based project reflecting original research.

**EDUC 257. Language, Culture, and Education (4)** Lecture, 3 hours; outside research, 3 hours.

Prerequisite(s): graduate standing or consent of instructor. Examines how culture and language influence educational processes and outcomes, by focusing on issues such as testing, gendered pedagogies, cultural adaptations of minority groups, social uses of literacy, Ebonics, bilingual education, and cultural capital.

**EDUC 259. Research Seminar (2)** Seminar, 2 hours. Prerequisite(s): EDUC 212 or EDUC 214 or consent of instructor. Involves research reports on topics in educational psychology, special education, curriculum and instruction, and educational administration. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EDUC 260. History of Curriculum (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): consent of instructor. Investigates the historical construction of schooling in general and specifically the curriculum — formal, informal, and hidden. Explores the purposes of schooling, the relation between schooling and U.S. culture, and the sociocultural contexts for changes and continuities in curriculum.

**EDUC 261. School Psychological Consultation (4)** Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor.

Theoretical and applied issues of consultative problem solving conducted in school settings. Principles derived from behavioral systems and organizational theories and how these principles are used in an indirect service-delivery model to facilitate changes in students' behavior.

**EDUC 262. Achievement Motivation (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 110 or equivalent or consent of instructor. This seminar covers the major approaches to achievement motivation with an emphasis on the cognitive approach. Topics include development and individual differences in achievement motivation, achievement-related attitudes and beliefs (e.g., self-concept, attributions, perceived control), relations between motivation and school performance.

**EDUC 263. Seminar in School Organization and Management (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Examines critical issues and processes associated with organizational management at the national, state, and local levels. Emphasis given to concerns involving educational decision making, socialization, and human resources management.

**EDUC 264. Professional School Psychology (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. Roles and functions of psychologists working in school settings with particular emphasis upon ethical standards for psychologists. Historical and legal evolution of school psychology is discussed along with issues in professional identity as school psychologists.

**EDUC 265A. Practicum in School Psychology: Introductory (2)** Seminar, 2 hours; practicum, 4 hours. Prerequisite(s): admission to the Ph.D. program in School Psychology. An introduction to school psychology practice. Topics include the roles and functions of school psychologists, ethical standards, historical and legal evolution of school psychology, licensing, professional organizations, and issues of professional identity. Includes hands-on experience in supervised, school-based settings. Graded Satisfactory (S) or No Credit (NC).

**EDUC 265B. Practicum in School Psychology: Basic (1)** Seminar, 10 hours per quarter; practicum, 8 hours. Prerequisite(s): EDUC 265A. An application of basic

principles in school psychology. Includes special education (SPED) law, California Education Code, and American Psychological Association diagnoses. Covers SPED eligibility, cultural sensitivity, diversity, and applied skills in cognitive and academic assessment. Addresses consultation, observation, and interviewing. Offers supervised experience in school-based settings. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

**EDUC 265C. Practicum in School Psychology: Advanced (1-2)** Seminar, 10 hours per quarter; practicum, 8-16 hours. Prerequisite(s): 2 units of EDUC 265B; consent of instructor is required for students enrolling in 2 units. An application of advanced principles in school psychology. Topics include behavioral, social, and emotional assessment, psychopharmacological intervention, group/crisis intervention, and psycho-educational evaluations. Addresses teacher/parent consultation, systems change, legal issues related to services, and National Credential in School Psychology licensure procedures. Offers hands-on experience in supervised, school-based settings. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

**EDUC 265D. Practicum in School Psychology: Clinical (1-2)** Seminar, 10 hours per quarter; practicum, 8-16 hours. Prerequisite(s): consent of instructor. An application of school psychology skills in clinical settings. Topics include alternative professional settings, current research, and best practice assessment and treatment of psychopathologic, neurologic, and genetic disorders. Addresses wrap-around services, residential and nonresidential treatment, and cultural sensitivity with families of children with disorders. Includes placement in supervised clinical settings. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

**EDUC 265E. Practicum in School Psychology: Supervision (1)** Seminar, 20 hours per quarter. Prerequisite(s): admission to the Ph.D. program in School Psychology. Development of knowledge and skills in supervision of school psychologists. Topics include the historical evolution and various theoretical orientations of supervision, as well as best practice in supervision in diverse settings. Also covers process of applying and interviewing for internship and preparation for the National Credential in School Psychology (NCSP) exam. Graded Satisfactory (S) or No Credit (NC).

**EDUC 266. Language, Schooling, and Identity (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program or consent of instructor. Examines how formal and informal educative institutions use language for identity formation and how students/novices respond to those institutional practices.

**EDUC 267. Culture of School Organizations (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the social scientific notion of culture, its use in organizational theory, and its application to the study of schools and school leadership.

**EDUC 268. Diversity in Educational Administration (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an understanding of school administrative and management issues related to the increasing diversity in schools. Theories about underrepresentation, diversity, legislation, harassment, and institutional participation reviewed. Cultural background, communication patterns, social networks, leadership, and administrative styles are considered.

**EDUC 269 (E-Z). Topics in Education (2 or 4)** Seminar, 2-3 hours; outside research, 0-3 hours.

Prerequisite(s): graduate standing or consent of instructor. A critical analysis of current theory and research in special areas of education. Covers a single topic not contained in a regular course.

Announcement of each topic will be made when the course is offered and designated as either a 2- or 4-unit course. E. Educational Psychology; I. Curriculum and Instruction; M. Institutional Leadership and Policy Studies; P. School Psychology; S. Special Education. Each segment is repeatable as topics change to a maximum of 16 units.

**EDUC 270. Reading Development and Intervention (4)** Seminar, 3 hours; term paper, 3 hours.

Prerequisite(s): graduate standing or consent of instructor. Introduces the findings from national panels on reading development, instruction, and intervention. Topics include practical application of these findings to the development of reading intervention programs for students across grades.

**EDUC 271. The School Principal: Tools for Managerial Problems (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): consent of instructor. Review of the literature on the principal's role as leader and manager of the school site. Topics include practices and problems of the school principal, interpersonal relations, political issues, communication techniques, and technology.

**EDUC 272. Sociolinguistics and Educational Processes (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): admission to Ph.D. program in Education or consent of instructor. Introduces sociolinguistic concepts (language maintenance and shift, diglossia, code-switching, standard versus dialect) as they relate to schooling. Examines issues such as diversity (linguistics, ethnic, class) and educational inequality, gender and language, minority languages, language attitudes, cultural mismatch, and language socialization.

**EDUC 273. Urban Educational Policy and Politics (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines issues confronting urban public schools and conditions influencing these institutions. Focuses on reforms advancing and undermining the urban school in America. Analyzes how schools influence and respond to urban and metropolitan environments.

**EDUC 274. Text Analysis (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analysis of written texts to study social and cognitive aspects of literacy. Topics include the writer-reader relationship, social construction of genre, text readability, teaching and learning, and textual indicators of student development.

**EDUC 275. Teaching and Learning (4)** Seminar, 2 hours; outside research, 6 hours. Prerequisite(s): first-year standing in the Ph.D. program in Education or second-year standing in the Ph.D. program in School Psychology. Explores issues and questions in teaching, learning, and child development. Addresses implications of various teaching and learning theories for curriculum, instruction, assessment, and teacher education.

**EDUC 276. Diversity and Curriculum (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate or professional standing. Describes and analyzes the controversy surrounding efforts to develop curriculum that addresses diversity in U.S. society. Examines changing theoretical perspectives on multicultural education and key concepts such as race,

identity, and culture. Reviews research on multicultural education.

**EDUC 277. Theoretical Perspectives on the Practice of Teaching (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): admission to the Ph.D. program in Education or consent of instructor. Examines a range of theoretical perspectives used in studying the practice of teaching. Covers psychological, historical, anthropological, sociological, and philosophical perspectives.

**EDUC 278. Research on Online Teaching and Learning (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys issues and research methods relevant to online teaching and learning. Topics include technologies for online learning, efficacy of online teaching and learning, design and usability of online courses, and community building, communication, and identity issues in online environments. Students design and study an online course.

**EDUC 279. Literacy and Technology (4)** Seminar, 3 hours; scheduled class, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores historical and contemporary relationships between technology and literacy from those involving clay tablets to those involving the Internet and digital media. Emphasis is on connections between social contexts of literacy practices, such as reading, writing, and language learning, and current technologies, such as video, the web, and interactive media.

**EDUC 280 (E-Z). Foundations in Education (4)** For hours and prerequisites, see segment descriptions. Foundation core courses that introduce students to theory and research in education. Offered in summer only.

**EDUC 280L. The Learner (4)** Lecture, 6 hours; outside research, 6 hours. Prerequisite(s): admission to the M.Ed. General Education Teaching Emphasis. Considers learning from psychological, cognitive, and social perspectives. Draws on recent research on the learning process in schools and other contexts. Emphasizes the relationship between teaching and learning. Offered in summer only.

**EDUC 280P. The Politics of Educational Decision Making (4)** Lecture, 6 hours; outside research, 6 hours. Prerequisite(s): admission to the M.Ed. General Education Teaching Emphasis. Analyzes how the political climate affects American schools. Topics include influences on educational policy, programs, and practice. Offered in summer only.

**EDUC 280R. The Classroom (4)** Lecture, 6 hours; outside research, 6 hours. Prerequisite(s): admission to the M.Ed. General Education Teaching Emphasis. Examines anthropological and sociological theory and research on the structure of and practices used in K-12 classrooms. Offered in summer only.

**EDUC 280S. The School (4)** Lecture, 6 hours; outside research, 6 hours. Prerequisite(s): admission to the M.Ed. General Education Teaching Emphasis. An analysis of the school as a formal organization, as well as a place of work for teachers and of learning for students. Examines the internal and external context of schools. Offered in summer only.

**EDUC 281. History of Educational Policy and Reform (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate or professional standing. Introduces a historical context for understanding education policy and reform in the United States. Topics include the ideological forces that shaped the institutional context and character of American education at different periods in the nation's history and how

ideas shaped the educational system by institutionalizing certain norms and values.

**EDUC 282A. Curriculum Theory and Instructional Processes: Mathematics and Science (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 172; concurrent enrollment in EDUC 336A or EDUC 338A. Introduces curriculum theory and instructional processes as they relate to mathematics and science in the multiple subjects classroom.

**EDUC 282B. Curriculum Theory and Instructional Processes: Social Studies, Visual and Performing Arts, and Physical Education (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 172; concurrent enrollment in EDUC 336B or EDUC 338B. Introduces curriculum theory and instructional processes as they relate to social studies, visual and performing arts, and physical education in the multiple subjects classroom.

**EDUC 283. Analyzing the Practice of Teaching (4)** Lecture, 2 hours; discussion, 1 hour; outside research, 3 hours. Prerequisite(s): admission to the M.Ed. program. Focuses on analysis of classroom teaching and examines how curriculum and instruction influence student understanding. Prepares students to conduct comprehensive analyses of K-12 instructional practice.

**EDUC 284. Theory and Research on Schooling and Social Inequality (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): admission to the Ph.D. program in Education or consent of instructor. Analyzes the social and cultural organization of schools and the relationship between schooling and social inequality. Draws upon research in sociology, anthropology, and education to examine theoretical perspectives on the relationship between schooling and social stratification, with special attention to the influence of class, race, and ethnicity on academic achievement.

**EDUC 285 (E-Z). Curriculum Theory and Instructional Processes (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): EDUC 109; EDUC 110; EDUC 116; EDUC 139; EDUC 172 or EDUC 174; or consent of instructor. Introduces curriculum theory and instructional processes as they relate to the single subject classroom. E. Secondary Social Studies; I. Secondary English; L. Secondary Foreign Language; M. Secondary Mathematics; N. Secondary Mathematics and Science; R. Secondary Visual and Performing Arts; S. Secondary Science; T. Portraits of Teaching.

**EDUC 286. American Education and the Civil Rights Movement (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the impact of the Civil Rights Movement on U.S. education, focusing primarily on the period from 1954 to the present.

**EDUC 287. Structural Equation Modeling (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): EDUC 216 or equivalent. Introduction to structural equation modeling (SEM) techniques. Emphasizes theory, application, and interpretation of techniques. Addresses development in the use and interpretation of specialized software. Topics include confirmatory factor analysis, covariance structure analysis, structural regression models, and latent change analysis. Considers model definition and specification, identification, estimation, and testing.

**EDUC 288. History of Urban Education in the United States (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the historical development of public and private elementary, secondary, and higher

education in United States urban areas. Also explores the formal and informal educational programs offered by various social and cultural groups in urban communities from the late eighteenth century to the present. Course is repeatable as topics change.

**EDUC 289. Theory and Research Methods in History of Education (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the central methods and theories of modern historical research. Includes the meaning of historical work and the methodological approaches historians use, as well as the range of approaches that can be utilized.

**EDUC 290. Directed Studies (1-6)** Prerequisite(s): graduate status and consent of instructor. Research and special studies in education. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EDUC 291. Individual Studies in Coordinated Areas (1-12)** Consultation, 1-12 hours. Prerequisite(s): graduate standing. A program of studies designed to assist students who are preparing for graduate degree examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 36 units prior to successful completion of Ph.D. qualifying examinations.

**EDUC 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): advanced graduate standing and consent of instructor. Directed research on selected problems in education. Graded Satisfactory (S) or No Credit (NC).

**EDUC 298-I. Individual Internship in School Psychology (4)** Individual study, 4 hours; internship, 35 hours. Prerequisite(s): third-year standing in the M.A. program in School Psychology or advancement to candidacy for the Ph.D. in School Psychology; consent of instructor. Supervised school psychology internship based on a written plan approved by the field supervisor and internship coordinator. Includes two hours per week of direct supervision by the field supervisor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

**EDUC 299. Research for Thesis or Dissertation (1-12)** directed independent studies, 1-6 hours. Prerequisite(s): advancement to candidacy for the master's or doctoral degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**EDUC 302. College Teaching Practicum (1-6)** practicum, 3-18 hours. Prerequisite(s): advanced Ph.D. standing and consent of instructor. A minimum of one quarter supervised teaching in college level classes under the supervision of the course instructor. Required of all doctoral candidates in the Graduate School of Education. Fulfills teaching portion of Ph.D. requirements. Graded Satisfactory (S) or No Credit (NC). May be taken for a maximum of three quarters.

**EDUC 303A. Level II Induction: Mild/Moderate Specialist (4)** Lecture, 2 hours; field, 6 hours. Prerequisite(s): a Level I Education Specialist Credential: Mild/Moderate Disabilities. Covers topics related to teaching of Mild/Moderate special education students. Includes development of an Induction Plan, defining the role of the school district mentor, development and maintenance of a professional portfolio, construction of Individualized Education Programs (IEP), Individualized Transition Programs (ITP), case studies, and verification logs. Students develop effective collaboration skills to work productively with the University and school districts. Graded Satisfactory (S) or No Credit (NC).

**EDUC 303B. Level II Summative Evaluation: Mild/Moderate Specialist (2)** Lecture, 1 hour; field, 3 hours. Prerequisite(s): two years of teaching experience in the specialization area of the student's level I Education Specialist Credential: Mild/Moderate Disabilities (may be completed concurrently); EDUC 303A. Students develop a five-year professional development plan, complete a comprehensive and professional portfolio based on their teaching experience in a class for individuals with mild/moderate disabilities, and undergo an evaluation process. Graded Satisfactory (S) or No Credit (NC).

**EDUC 304A. Level II Induction: Moderate/Severe Specialist (4)** Lecture, 2 hours; field, 6 hours. Prerequisite(s): a Level I Education Specialist Credential: Moderate/Severe Disabilities. Covers topics related to teaching of Moderate/Severe special education students. Includes development of an Induction Plan, defining the role of the school district mentor, development and maintenance of a professional portfolio, construction of Individualized Education Programs (IEP), Individualized Transition Programs (ITP), case studies, and verification logs. Students develop effective collaboration skills to work productively with the University and school districts. Graded Satisfactory (S) or No Credit (NC).

**EDUC 304B. Level II Summative Evaluation: Moderate/Severe Specialist (2)** Lecture, 1 hour; field, 3 hours. Prerequisite(s): two years of teaching experience in the specialization area of the student's level I Education Specialist Credential: Moderate/Severe Disabilities (may be completed concurrently); EDUC 304A. Students develop a five-year professional development plan, complete a comprehensive and professional portfolio based on their teaching experience in a class for individuals with moderate/severe disabilities, and undergo an evaluation process. Graded Satisfactory (S) or No Credit (NC).

**EDUC 320A. Integrating Technology into Classroom Practice (1)** Lecture, 8 hours per quarter; laboratory, 3 hours per quarter; field, 3 hours per quarter. Prerequisite(s): admission to a teaching credential program. Introduction to technology in education. Prepares future teachers to effectively utilize computers and related technology for information management, presentations, and classroom instruction. Topics include software, the Internet, and basic operations of educational technology. Includes field observations in schools. Graded Satisfactory (S) or No Credit (NC).

**EDUC 320B. Integrating Technology into Classroom Practice (1)** Lecture, 8 hours per quarter; laboratory, 3 hours per quarter; field, 3 hours per quarter. Prerequisite(s): EDUC 320A. Focuses on the application of computer technology to curriculum and instruction. Topics include Internet applications, non-computer technology, and use of technology to enhance problem solving skills. Includes field observations in schools. Graded Satisfactory (S) or No Credit (NC).

**EDUC 320C. Integrating Technology into Classroom Practice (1)** Lecture, 4 hours per quarter; laboratory, 15 hours per quarter; field, 3 hours per quarter. Prerequisite(s): EDUC 320A, EDUC 320B. Addresses issues related to the use of technology in schools. Using presentation software, the Internet, and other computer-based technology, students develop and teach a curriculum unit appropriate to their teaching subject area and/or grade level. Emphasis is on integrating the use of computer-based applications with instruction. Graded Satisfactory (S) or No Credit (NC).

**EDUC 335A. Supervised Teaching in Special Education (4)** Seminar, 2 hours; field, 9 hours.

Prerequisite(s): admission to the Education Specialist Credential program; concurrent enrollment in or completion of EDUC 110, EDUC 116, and EDUC 172. Supervised teaching in special education. Consists of supervised field experience and seminar for special education candidates. Graded Satisfactory (S) or No Credit (NC).

**EDUC 335B. Supervised Teaching in Special Education (7)** Seminar, 2 hours; field, 18 hours. Prerequisite(s): EDUC 335A. Supervised teaching in special education. Consists of supervised observation, field experience, and seminar for special education candidates. Graded Satisfactory (S) or No Credit (NC).

**EDUC 335C. Seminar in Special Education (2)** Seminar, 2 hours. Prerequisite(s): EDUC 335B; concurrent enrollment in EDUC 345A or EDUC 345B. Analyzes the instructional processes used in special education settings. Includes assessing students, developing an individualized educational plan (IEP), and collaborating with parents, teachers, and special services personnel.

**EDUC 336A. Supervised Teaching in the Elementary School (2)** Field, 9 hours. Prerequisite(s): admission to a teaching credential program; concurrent enrollment in EDUC 282A and EDUC 344A; concurrent enrollment in or completion of EDUC 337A. Supervised teaching in the multiple subjects classroom. Required of all candidates for the Multiple Subjects Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 336A or EDUC 338A.

**EDUC 336B. Supervised Teaching in the Elementary School (5)** Field, 18 hours. Prerequisite(s): EDUC 110, EDUC 336A; concurrent enrollment in EDUC 282B and EDUC 344B; concurrent enrollment in or completion of EDUC 337B. Supervised teaching in the multiple subjects classroom. Required of all candidates for the Multiple Subjects Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 336B or EDUC 338B.

**EDUC 336C. Supervised Teaching in the Elementary School (11)** Field, 36 hours. Prerequisite(s): EDUC 336B; concurrent enrollment in EDUC 344C; concurrent enrollment in or completion of EDUC 337C. Supervised teaching in the multiple subjects classroom. Required of all candidates for the Multiple Subjects Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 336C or EDUC 338C.

**EDUC 337A. Teaching Performance Assessment for Multiple Subjects Candidates (1)** Field, 2 hours; written work, 2 hours. Prerequisite(s): admission to a teaching credential program or an intern teaching program; concurrent enrollment in or completion of EDUC 336A or concurrent enrollment in or completion of EDUC 338A. Performance assessment for California teachers. Topics include lesson design, classroom instruction in public schools, and assessment design. Fieldwork hours completed in regular placement as assigned for EDUC 336A or EDUC 338A. Required of all candidates for the Multiple Subjects Credential. Graded Satisfactory (S) or No Credit (NC).

**EDUC 337B. Teaching Performance Assessment for Multiple Subjects Candidates (1)** Field, 2 hours; written work, 2 hours. Prerequisite(s): admission to a teaching credential program or an intern teaching program; concurrent enrollment in or completion of EDUC 336B or concurrent enrollment in or completion of EDUC 338B. Performance assessment for California teachers. Topics include lesson design, classroom instruction in public schools, and assessment design. Fieldwork hours completed in regular placement as assigned for EDUC 336B or EDUC

338B. Required of all candidates for the Multiple Subjects Credential. Graded Satisfactory (S) or No Credit (NC).

**EDUC 337C. Teaching Performance Assessment for Multiple Subjects Candidates (1)** Field, 2 hours; written work, 2 hours. Prerequisite(s): admission to a teaching credential program or an intern teaching program; concurrent enrollment in or completion of EDUC 336C or concurrent enrollment in or completion of EDUC 338C. Performance assessment for California teachers. Topics include lesson design, classroom instruction in public schools, and assessment design. Fieldwork hours completed in regular placement as assigned for EDUC 336C or EDUC 338C. Required of all candidates for the Multiple Subjects Credential. Graded Satisfactory (S) or No Credit (NC).

**EDUC 338A. Intern Teaching in the Elementary School (9)** Field, 30 hours. Prerequisite(s): EDUC 110, EDUC 172, EDUC 177A; admission to intern teaching program; concurrent enrollment in EDUC 282A and EDUC 344A; concurrent enrollment in or completion of EDUC 337A. Intern teaching in the multiple subjects classroom. Required for the Multiple Subjects Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 336A or EDUC 338A.

**EDUC 338B. Intern Teaching in the Elementary School (9)** Field, 30 hours. Prerequisite(s): EDUC 338A; concurrent enrollment in EDUC 282B and EDUC 344B; concurrent enrollment in or completion of EDUC 337B. Intern teaching in the multiple subjects classroom. Required for the Multiple Subjects Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 336B or EDUC 338B.

**EDUC 338C. Intern Teaching in the Elementary School (9)** Field, 30 hours. Prerequisite(s): EDUC 338B; concurrent enrollment in EDUC 344C; concurrent enrollment in or completion of EDUC 337C. Intern teaching in the multiple subjects classroom. Required for the Multiple Subjects Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 336C or EDUC 338C.

**EDUC 340A. Adapting Core Curriculum and Standards-Based Instruction (Mild-Moderate Disabilities) (4)** Lecture, 3 hours; laboratory, 5 hours. Prerequisite(s): admission to the Specialized Preparation Program. Addresses techniques that foster access to core curriculum for students with mild/moderate disabilities. Emphasizes principles and issues related to cooperative learning, differentiated instruction, grouping, individualization, mainstreaming, and serving students in inclusive environments. Examines the relationship of IEP goals and the impact of high-stakes testing on the special needs student.

**EDUC 340B. Instructional Processes for Severely Handicapped Students (5)** Lecture, 3 hours; laboratory, 5 hours. Prerequisite(s): admission to the Specialized Preparation Program. Development and learning needs of severely handicapped students: curriculum, procedures, and materials. Includes participation in public school programs.

**EDUC 344A. Multiple Subjects Credential Seminar (2)** Seminar, 2 hours. Prerequisite(s): concurrent enrollment in EDUC 336A or EDUC 338A or consent of instructor. Analyzes instructional processes used in multiple subjects classrooms. Topics include classroom management, curriculum planning, instructional strategies, and oral and written communication skills.

**EDUC 344B. Multiple Subjects Credential Seminar (2)** Seminar, 2 hours. Prerequisite(s): EDUC 139, EDUC

172, EDUC 344A; concurrent enrollment in EDUC 336B or EDUC 338B. Analyzes instructional processes used in multiple subjects classrooms. Topics include classroom management, curriculum planning and instructional strategies, K-12 academic standards in mathematics related to classroom curriculum and activities, and teaching language arts in the content areas.

**EDUC 344C. Multiple Subjects Credential Seminar (2)** Seminar, 2 hours. Prerequisite(s): EDUC 344B; concurrent enrollment in EDUC 336C or EDUC 338C. Analyzes instructional processes used in multiple subjects classrooms. Topics include classroom management; curriculum planning; instructional strategies; K-12 academic standards in history and the social sciences, the visual and performing arts, health, and physical education; and teaching language arts in the content area.

**EDUC 345A. Supervised Student Teaching in a Special Class for Individuals with Mild/Moderate Disabilities (12)** Field, 36 hours. Prerequisite(s): admission to a special education credential program; EDUC 335B; concurrent enrollment in EDUC 335C. Student teaching in a special education day class for individuals with mild/moderate disabilities. Required for the Education Specialist Instruction Credential in Mild/Moderate Disabilities. Graded Satisfactory (S) or No Credit (NC).

**EDUC 345B. Supervised Student Teaching in a Special Class for Individuals with Moderate/Severe Disabilities (12)** Field, 36 hours. Prerequisite(s): admission to a special education credential program; EDUC 335B; concurrent enrollment in EDUC 335C. Student teaching in a special education day class for individuals with moderate/severe disabilities. Required for the Education Specialist Instruction Credential in Moderate/Severe Disabilities. Graded Satisfactory (S) or No Credit (NC).

**EDUC 346A. Supervised Intern Teaching in a Special Class for Individuals with Mild/Moderate Disabilities (9)** Seminar, 2 hours; field, 30 hours. Prerequisite(s): admission to an internship program in mild/moderate disabilities; EDUC 340A (may be taken concurrently). Intern teaching in a special education day class for individuals with mild/moderate disabilities. Required for the Education Specialist Internship Credential in Mild/Moderate Disabilities. Graded Satisfactory (S) or No Credit (NC).

**EDUC 346B. Supervised Intern Teaching in a Special Class for Individuals with Mild/Moderate Disabilities (9)** Seminar, 2 hours; field, 30 hours. Prerequisite(s): admission to an internship program in mild/moderate disabilities; EDUC 346A. Intern teaching in a special education day class for individuals with mild/moderate disabilities. Required for the Education Specialist Internship Credential in Mild/Moderate Disabilities. Graded Satisfactory (S) or No Credit (NC).

**EDUC 346C. Supervised Intern Teaching in a Special Class for Individuals with Mild/Moderate Disabilities (9)** Seminar, 2 hours; field, 30 hours. Prerequisite(s): admission to an internship program in mild/moderate disabilities; EDUC 346B. Consists of intern teaching in a special education day class for individuals with mild/moderate disabilities. Required for the Education Specialist Internship Credential in Mild/Moderate Disabilities. Graded Satisfactory (S) or No Credit (NC).

**EDUC 347A. Supervised Intern Teaching in a Special Class for Individuals with Moderate/Severe Disabilities (9)** Seminar, 2 hours; field, 30 hours. Prerequisite(s): admission to an internship program in moderate/severe disabilities; EDUC 340B (may be

taken concurrently). Intern teaching in a special education day class for individuals with moderate/severe disabilities. Required for the Education Specialist Internship Credential in Moderate/Severe Disabilities. Graded Satisfactory (S) or No Credit (NC).

**EDUC 347B. Supervised Intern Teaching in a Special Class for Individuals with Moderate/Severe Disabilities (9)** Seminar, 2 hours; field, 30 hours. Prerequisite(s): admission to an internship program in moderate/severe disabilities; EDUC 347A. Intern teaching in a special education day class for individuals with moderate/severe disabilities. Required for the Education Specialist Internship Credential in Moderate/Severe Disabilities. Graded Satisfactory (S) or No Credit (NC).

**EDUC 347C. Supervised Intern Teaching in a Special Class for Individuals with Moderate/Severe Disabilities (7)** Field, 21 hours. Prerequisite(s): admission to an internship program in moderate/severe disabilities; EDUC 347B. Intern teaching in a special education day class for individuals with moderate/severe disabilities. Required for the Education Specialist Internship Credential in Moderate/Severe Disabilities. Graded Satisfactory (S) or No Credit (NC).

**EDUC 348A. Single Subject Credential Seminar (2)** Seminar, 2 hours. Prerequisite(s): concurrent enrollment in or completion of EDUC 110 and EDUC 174; concurrent enrollment in EDUC 378A. Analyzes instructional problems encountered by candidates in the single subject classroom. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

**EDUC 348B. Single Subject Credential Seminar (2)** Seminar, 2 hours. Prerequisite(s): EDUC 348A; concurrent enrollment in EDUC 378B. Analyzes instructional problems encountered by candidates in the single subject classroom. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

**EDUC 348C. Single Subject Credential Seminar (2)** Seminar, 2 hours. Prerequisite(s): EDUC 348B; concurrent enrollment in EDUC 378C. Analyzes instructional problems encountered by candidates in the single subject classroom. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

**EDUC 354A. Orientation to Educational Administration and Policy (4)** Seminar, 15 hours per quarter; field, 7.5 hours. Prerequisite(s): admission to the Preliminary Administrative Services Credential program. Orientation to the field of educational administration and policy formation. Focuses on analysis, management skills, and mentoring.

**EDUC 354B. Competence in Educational Administration and Policy (4)** Seminar, 15 hours per quarter; field, 7.5 hours. Prerequisite(s): EDUC 354A; admission to the Preliminary Administrative Services Credential program. Evaluation of the students' skills in educational administration and policy formation. Students present professional growth portfolios demonstrating their competence in inquiry, reflection, and problem solving.

**EDUC 355. Field Experience in School Administration (4)** Lecture, 3 hours; field, 3-15 hours. Prerequisite(s): consent of instructor. Supervised field experience. The planning, execution and evaluation of administrative tasks under the supervision of local school administrators and university personnel. May be repeated for credit.

**EDUC 365A. Advanced Study of Educational Administration and Policy Formation (4)** Seminar, 2

hours; field, 6 hours. Prerequisite(s): admission to the Professional Administrative Services Credential program. Advanced study of educational administration and policy formation. Emphasis is on analysis and problem solving. Topics include interpersonal relationships, mentoring, policy development, and policy administration.

**EDUC 365B. Advanced Study of Educational Administration and Policy Formation (4)** Seminar, 2 hours; field, 6 hours. Prerequisite(s): admission to the Professional Administrative Services Credential program. Evaluation of the students' skills in educational administration and policy development. Students present professional growth portfolios demonstrating their competence in inquiry, reflection, and problem solving.

**EDUC 366. Specialized Field Experience in School Administration (4)** Seminar, 3 hours; fieldwork, 10-15 hours. Prerequisite(s): EDUC 365A- EDUC 365B; possession of California Preliminary Administrative Services Credential or equivalent; an administrative job in education or consent of instructor. Advanced level field experience covering special topics in educational administration. Individually planned and guided tasks in an area of specialized study, selected in consultation with faculty and executed under the supervision of selected school administrators and University faculty.

**EDUC 376A. Supervised Teaching in the Secondary School (2)** Field, 9 hours. Prerequisite(s): concurrent enrollment in or completion of EDUC 110, EDUC 174, and EDUC 377A; admission to a teaching credential program; concurrent enrollment in EDUC 348A. Supervised teaching in the single subject classroom. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 376A or EDUC 378A.

**EDUC 376B. Supervised Teaching in the Secondary School (5)** Field, 18 hours. Prerequisite(s): EDUC 376A; concurrent enrollment in or completion of EDUC 377B; concurrent enrollment in EDUC 348B. Supervised teaching in the single subject classroom. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 376B or EDUC 378B.

**EDUC 376C. Supervised Teaching in the Secondary School (11)** Field, 36 hours. Prerequisite(s): EDUC 376B; concurrent enrollment in or completion of EDUC 377C; concurrent enrollment in EDUC 348C. Supervised teaching in the single subject classroom. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 376C or EDUC 378C.

**EDUC 377A. Teaching Performance Assessment for Single Subject Candidates (1)** Field, 2 hours; written work, 2 hours. Prerequisite(s): admission to a teaching credential program or an intern teaching program; concurrent enrollment in or completion of EDUC 376A or concurrent enrollment in or completion of EDUC 378A. Performance assessment for California teachers. Topics include lesson design, classroom instruction in public schools, and assessment design. Fieldwork hours completed in regular placement as assigned for EDUC 376A or EDUC 378A. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC).

**EDUC 377B. Teaching Performance Assessment for Single Subject Candidates (1)** Field, 2 hours; written work, 2 hours. Prerequisite(s): admission to a teaching credential program or an intern teaching program; concurrent enrollment in or completion of EDUC 376B

or concurrent enrollment in or completion of EDUC 378B. Performance assessment for California teachers. Topics include lesson design, classroom instruction in public schools, and assessment design. Fieldwork hours completed in regular placement as assigned for EDUC 376B or EDUC 378B. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC).

**EDUC 377C. Teaching Performance Assessment for Single Subject Candidates (1)** Field, 2 hours; written work, 2 hours. Prerequisite(s): admission to a teaching credential program or an intern teaching program; concurrent enrollment in or completion of EDUC 376C or concurrent enrollment in or completion of EDUC 378C. Performance assessment for California teachers. Topics include lesson design, classroom instruction in public schools, and assessment design. Fieldwork hours completed in regular placement as assigned for EDUC 376C or EDUC 378C. Required of all candidates for the Single Subjects Credential. Graded Satisfactory (S) or No Credit (NC).

**EDUC 378A. Intern Teaching in the Secondary School (9)** Field, 30 hours. Prerequisite(s): EDUC 110, EDUC 174, EDUC 177A; admission to intern teaching program; concurrent enrollment in or completion of EDUC 377A; concurrent enrollment in EDUC 348A. Intern teaching in the single subject classroom. Required for the Single Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 376A or EDUC 378A.

**EDUC 378B. Intern Teaching in the Secondary School (9)** Field, 30 hours. Prerequisite(s): EDUC 378A; concurrent enrollment in or completion of EDUC 377B; concurrent enrollment in EDUC 348B. Intern teaching in the single subject classroom. Required for the Single Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 376B or EDUC 378B.

**EDUC 378C. Intern Teaching in the Secondary School (9)** Field, 30 hours. Prerequisite(s): EDUC 378B; concurrent enrollment in or completion of EDUC 377C; concurrent enrollment in EDUC 348C. Intern teaching in the single subject classroom. Required for the Single Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 376C or EDUC 378C.

## Education Abroad Program

Jean-Xavier Guinard, Ph.D., Associate Vice Provost and Executive Director,  
UCEAP Systemwide Office,  
Goleta, CA

### UCR Contact Office

International Education Center  
University Village Suite 204  
(951) 827-4113  
[internationalcenter.ucr.edu](http://internationalcenter.ucr.edu)

Search for programs by specific areas at  
<http://eap.ucop.edu>

### Purpose

The Education Abroad Program (EAP) offers students the opportunity to experience a different culture while earning UC credit. Established in 1961, the EAP is the University of

California's official study abroad program. International study options are available in 35 countries throughout the world at the finest universities abroad.

Most of the program study centers are directed by a UC faculty member in residence. The directors and staff advise students on academic, cultural, social, and personal matters, and serve as a resource for cultural and social opportunities.

Stimulation of general intellectual development, enhancement of independent study and second language skills, improved prospects for graduate and professional school admission, an increase of self-awareness, clarification of career and life purposes, and a broadening and deepening of personal values are a few of the advantages gained from this opportunity.

## Academic Program

See <http://eap.ucop.edu> for partner universities and study options. Participants may fulfill lower-division, degree, major, or elective requirements and often enhance their UC education by taking courses not available at UCR. The study center director facilitates the academic work of the students through liaison with faculty at the host university.

Spanning all continents, EAP offers traditional academic year, short-term, and summer programs. Students who want to gain basic foreign language skills have Language and Culture options. Thematic options include Engineering in Hong Kong and Japan, Tropical Biology in Costa Rica, and Health Sciences. Students anticipating a business career have a broad range of locations to enhance their preparation, including in-depth study on NAFTA, the European Union, and Central Europe. Internships can be arranged in nearly all fields of study. Future teachers, in particular, have benefited from teaching opportunities in China, Japan, and Mexico. Undergraduates have several possibilities to conduct field research in Costa Rica, Ghana, Mexico, and South Africa.

Depending upon the study center, EAP also provides a 5- to 10-week Intensive Language Program, which prepares students for the new country and academic system by augmenting the prerequisite language background.

## Academic Planning

Interested students should consult well in advance with their academic advisor and college counselor to determine how participation in the program would affect their degree progress. Students with a double major or minor must pay particular attention to pre-departure planning.

Search for programs by specific areas of study at <http://eap.ucop.edu>.

Seniors and transfer students must receive clearance of the university's graduation residence requirement from their college dean. Refer to the Residence Requirement section under Academic Regulations.

## EAP Opportunities and Countries

(visit [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) for program details and all the latest updates)

### Argentina

Universidad Tres De Febrero, Buenos Aires  
University of Belgrano

### Australia

Australian National University  
La Trobe University  
Monash University  
University of Adelaide  
University of Melbourne  
University of New South Wales  
University of Queensland  
University of Sydney  
University of Western Australia  
University of Wollongong

### Barbados

University of the West Indies, Cave Hill

### Botswana

University of Botswana

### Brazil

Pontifical Catholic University of Rio de Janeiro

### Canada

The University of British Columbia

### Chile

Pontifical Catholic University of Chile  
University of Chile

### China

Beijing Normal University  
East China Normal University  
Fudan University  
Peking University, Beijing  
Tsinghua University, Beijing

### Costa Rica

Monteverde Institute

### Denmark

University of Copenhagen

### Egypt

American University in Cairo

### France

École Normale Supérieure, Paris  
Institut d'Études Politiques (Sciences Po)  
UC Center, Paris  
University of Bordeaux  
University of Lyon

### Germany

Free University of Berlin  
Georg-August University of Göttingen  
Humboldt University, Berlin  
Technical University, Berlin  
University of Potsdam

### Ghana

University of Ghana, Legon

### Hong Kong

Chinese University of Hong Kong  
Hong Kong Polytechnic University  
Hong Kong University of Science and Technology  
School of Management  
School Engineering  
School of Science  
University of Hong Kong

### India

University of Delhi  
University of Hyderabad

### Ireland

National University of Ireland, Galway  
Trinity College, Dublin  
University College, Cork  
University College, Dublin

### Israel

Hebrew University of Jerusalem

### Italy

UC Center, Florence  
UC Center, Rome  
University of Bologna  
University of Commerce Luigi Bocconi  
University of Padova

### Japan

International Christian University  
Doshisha University  
Hitotsubashi University  
Keio University  
Meiji Gakuin University  
Osaka University  
Tohoku University  
Tsuru University  
University of Tokyo  
Waseda University

### Korea

Yonsei University

### Mexico

UC Center, Mexico City  
National Autonomous University of Mexico

### The Netherlands

Maastricht University- Faculty of Economics & Business Administration  
University College, Maastricht  
University College, Utrecht  
Utrecht University

### New Zealand

Lincoln University  
Massey University  
University of Auckland  
University of Canterbury  
University of Otago  
University of Waikato  
Victoria University of Wellington

### Russia

St. Petersburg State University

### Singapore

National University of Singapore  
Singapore Agency for Science, Technology & Research

### South Africa

University of Cape Town

### Spain

Autonomous University of Barcelona  
Complutense University of Madrid  
Carlos III University  
Pompeu Fabra University, Barcelona  
UC Center, Madrid  
University of Barcelona  
University of Córdoba  
University of Granada

### Sweden

University of Lund

### Taiwan

National Chengchi University  
National Taiwan University

### Tanzania

University of Tanzania

### Thailand

Thammasat University

### Turkey

Bilkent University  
Bogaziçi University  
Koç University  
Middle East Technical University

### United Kingdom —

Imperial College, London  
London School of Economics  
UC Center, Edinburgh  
UC Center, London Bloomsbury  
University of Bristol  
University of Cambridge, Pembroke College  
University of Durham  
University of East Anglia  
University of Edinburgh  
University of Glasgow  
University of Kent  
University of Leeds  
University of London, King's College  
University of London, Queen Mary  
University of Manchester  
University of St. Andrews  
University of Sussex  
University of Warwick  
University of York

### Vietnam

Hanoi University

To record units and grade points earned through EAP on the participant's UCR transcript, students are concurrently enrolled at UCR and at the host university. Subsequent fulfillment of major and degree requirements depends upon UC departmental and campus criteria.

## Eligibility and Selection

Requirements vary widely by program option. For most programs, students must meet the cumulative grade point average requirements of partner universities at the time of selection and maintain the support of the UCR Selection Committee throughout the pre-departure period.

In addition to academic criteria, selection is also based on the student's seriousness of purpose, maturity, clear goals, and the capacity to adapt to the experience of study abroad.

Prior to departure, selected students must obtain clearance from the university's Student Health Service and participate in orientation activities.

Graduate students who have completed at least one year of graduate work and have the approval of their department and the Graduate Division are eligible for some EAP study centers. Foreign language proficiency, if required, must be demonstrated. Graduate students remain under the academic direction of their UCR graduate advisor. An EAP experience may prove especially valuable to doctoral candidates who have been advanced to candidacy and are engaged in independent study and research directed toward their dissertation.

## Financial Matters

EAP is financially comparable to studying at UCR. In some cases, study on EAP costs less. Additional costs directly related to the program are round-trip transportation, health clearance, on-site orientation, and, if required, intensive language instruction. The university shares the cost of comprehensive medical and hospitalization coverage for all participants.

Many forms of financial assistance are available to EAP participants. Students who do not currently receive UC financial aid may qualify for aid while on EAP. Students receiving state and federal financial aid may use their scholarships, grants, loans, and veteran's benefits to finance their program abroad. In addition to campus-awarded financial aid, EAP provides support through various scholarships and grants. Prospective participants should consult early with EAP counselors for national scholarship opportunities.

## Student Conduct

Students selected for the EAP program have made a serious commitment to profit from all aspects of their international experience. As guests in another country and another university, their conduct reflects on both the UC and the United States. Students are responsible to

the study center director, to the director of EAP, and to the faculty of the UC and the host university related to the program. The director of EAP reserves the right to terminate the participation in the program of any student whose conduct (in either academic or nonacademic matters), after careful consideration and full review, is judged to be contrary to the standards and regulations of the UC and the host university.

Study center directors are available to students and are responsible for all aspects of student welfare and conduct.

## Application

Applications for 2012–2013 will be available beginning September 2011. Students are encouraged to consult IEC advisors early in the EAP planning process to avoid missing application deadlines. The center is located in University Village Suite 204, or call (951) 827-4113. Program details are available at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu).

# Electrical Engineering

**Subject abbreviation: EE**  
**The Marlan and Rosemary Bourns**  
**College of Engineering**

Jay A. Farrell, Ph.D., Chair  
 Department Office,  
 343 Engineering Building Unit 2  
 (951) 827-2484; [www.ee.ucr.edu](http://www.ee.ucr.edu)

### Professors

Alexander Balandin, Ph.D.  
 Matthew J. Barth, Ph.D.  
 Bir Bhanu, Ph.D., *Distinguished Professor*  
 Jie Chen, Ph.D.  
 Ilya Dumer, Ph.D.  
 Jay A. Farrell, Ph.D.  
 Susan Hackwood, Ph.D.  
 Yingbo Hua, Ph.D.  
 Alexander Korotkov, Ph.D.  
 Roger Lake, Ph.D.  
 Jianlin Liu, Ph.D.  
 Mihri Ozkan, Ph.D.  
 Xiang-Dong "Sheldon" Tan, Ph.D.  
 Albert Wang, Ph.D.  
 Zhengyuan "Daniel" Xu, Ph.D.

### Professor Emeritus

Gerardo Beni, Ph.D.

### Associate Professors

Ping Liang, Ph.D.  
 Amit Roy Chowdhury, Ph.D.  
 Wei Ren, Ph.D.  
 Ertem Tuncel, Ph.D.

### Assistant Professors

Elaine D. Haberer, Ph.D.  
 Anastasios I. Mourikis, Ph.D.  
 Qi Zhu, Ph.D.

\*\*

### Adjunct Professors

Bahram Parvin, Ph.D.  
 Hossny El-Sherief, Ph.D.  
 Sakhrat Khizroev, Ph.D.

### Associate Adjunct Professor

Aleksander Khitun, Ph.D.  
 Gang Chen, Ph.D.

### Cooperating Faculty

Guillermo Aguilar, Ph.D. (Mechanical Engineering)  
 Ludwig Bartels, Ph.D. (Chemistry)  
 Laxmi Bhuyan, Ph.D. (Computer Science and Engineering)  
 Phillip Brisk, Ph.D. (Computer Science and Engineering)  
 Paulo C. Chagas, Ph.D. (Music)  
 Michalis Faloutsos, Ph.D. (Computer Science and Engineering)  
 Keh-Shin Lii, Ph.D. (Statistics)  
 Julia Lyubovitsky, Ph.D. (Bioengineering)  
 Mart Molle, Ph.D. (Computer Science and Engineering)  
 Ashok Mulchardani, Ph.D. (Chemical Engineering)  
 Walid Najjar, Ph.D. (Computer Science and Engineering)  
 Cengiz Ozkan, Ph.D. (Mechanical Engineering)  
 Thomas Stavovich, Ph.D. (Mechanical Engineering)  
 Frank Wahid, Ph.D. (Computer Science and Engineering)

### Affiliated Emeritus

J. Keith Oddson, Ph.D. (Mathematics)

### Lecturers

Feras Abou-Galala, Ph.D.  
 Roman Chomko, Ph.D.

## Major

The Department of Electrical Engineering offers B.S., M.S., and Ph.D. degrees in Electrical Engineering.

The Electrical Engineering program objectives are to produce graduates able to:

- develop and pursue successful careers in electrical engineering
- apply electrical engineering knowledge and skills to further careers in a broad range of professional occupations
- conduct successful graduate studies and research at major research universities
- demonstrate innovation and creativity and pursue lifelong learning in solving engineering problems
- work effectively in a team environment, communicate well, attain professional growth, and provide leadership in engineering
- exercise professional responsibility and sensitivity to a broad range of social concerns, such as ethical, environmental, economic, regulatory, and global issues

All undergraduates in the College of Engineering must see an advisor at least annually. Visit [student.engr.ucr.edu](http://student.engr.ucr.edu) for details.

The Electrical Engineering B.S. degree at UCR is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700. For more details see [ee.ucr.edu](http://ee.ucr.edu).

## Undergraduate Program Focus Areas

The electrical engineering undergraduate program offers the following focus areas:

- 1. Communications, Signal Processing and Networking** Fundamental and state-of-the-art theory and applications of communications, networking of devices, and related signal processing, involving information sources in the form of audio, video, image and text messages and transmission media of wire, wireless (radio frequency), fiber optics, etc.
- 2. Computer Engineering** The Electrical Engineering department offers a Computer Engineering program in conjunction with the Computer Science and Engineering department. Example applications are embedded system design, reconfigurable systems, parallel and high-performance computing, microprocessors, nanometer integrated circuit design, and computer-aided design (CAD) techniques. See detailed descriptions in the Computer Engineering Program.
- 3. Control and Robotics** Theory and design of control of systems and robots. Example applications include control systems in automotive, satellite, aircraft, computer hard drive, robotic manufacturing, autonomous robots, cell phone signal tracking, among others.
- 4. Intelligent Systems** Theory, design and development of systems capable of intelligent decisions. Example applications include video surveillance systems, medical imaging devices, intelligent transportation systems, and manufacturing automation.
- 5. Nanotechnology, Advanced Materials and Devices** Synthesis and characterization of advanced materials at nanometer scale, theory, design and fabrication of electronic and optoelectronic devices. Example applications include creation of ultra-fast low-power transistors, efficient solar cells for energy generation, high-density memory for smart phones and mobile services, and tiny devices for medical applications.
- 6. VLSI Design and Systems** Theory, design and methodologies of very large scale, nanometer integrated circuits. Example applications include microprocessors, analog and mixed signal circuits, RF circuits for cell phones and wireless networks, system-on-chip (SOC), application specific integrated circuits (ASIC).

All undergraduates in the College of Engineering must see an advisor at least annually. For details, visit [student.engr.ucr.edu](http://student.engr.ucr.edu).

## University Requirements

See Undergraduate Studies section.

## College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Electrical Engineering major uses the following major requirements to satisfy the col-

lege's Natural Sciences and Mathematics breadth requirement.

1. One course in the biological sciences chosen from an approved list
2. CHEM 001A, CHEM 011A
3. MATH 008B or MATH 009A
4. PHYS 040A, PHYS 040B

## Major Requirements

1. Lower-division requirements (74 units)
  - a) One course in the biological sciences chosen from an approved list
  - b) CHEM 001A, CHEM 011A
  - c) CS 010, CS 013, CS 061
  - d) EE 001A, EE 011A, EE 001B, EE 010, EE 020
  - e) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
  - f) PHYS 040A, PHYS 040B, PHYS 040C
2. Upper-division requirements (82 units)
  - a) EE 100A, EE 100B, EE 105, EE 110A, EE 110B, EE 114, EE 115, EE 116, EE 132, EE 141, EE 175A, EE 175B
  - b) CS 120A/EE 120A, CS 120B/EE 120B
  - c) ENGR 180W
  - d) Twenty (20) units of technical electives (chosen with the approval of a faculty advisor) from CS 122A, CS 130, CS 143/EE 143, CS 161, CS 168; EE 117, EE 128, EE 133, EE 134, EE 135, EE 136, EE 137, EE 138, EE 139, EE 140, EE 144, EE 146, EE 150, EE 151, EE 152, EE 160

The choice of technical electives must ensure that the upper division requirements include at least one coherent sequence of at least three (3) electrical engineering courses to ensure depth in one area of electrical engineering. Example course sequences are available through the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu).

## Graduate Program

The Department of Electrical Engineering offers programs leading to M.S. and Ph.D. degrees.

University requirements for the M.S. and Ph.D. degrees in Electrical Engineering are given in the Graduate Studies section of this catalog.

Research focus areas currently include communications, computer vision, control, detection and estimation, distributed systems, electronic materials, error-correcting codes, image processing, information theory, intelligent sensors, intelligent systems, machine learning, modeling and simulation, multimedia, nanostructures and nanodevices, navigation, neural networks, pattern recognition, robotics and automation, signal processing, solid-state

devices and circuits, system identification, and transportation systems.

**Combined B.S. + M.S. Five-Year Program** The college offers a combined B.S. + M.S. program in Electrical Engineering designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, a combined SAT Reasoning score above 1950 (or ACT plus Writing equivalent), complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

**Admission** All applicants must submit official scores for the GRE General Test. All applicants whose native language is not English and who do not have a degree from an institution where English is the exclusive language of instruction must complete the Test of English as a Foreign Language (TOEFL) with a minimum score of 550 (paper-based), 213 (computer-based), or 80 (Internet-based).

Applicants must meet the general admission requirements of the Riverside Division of the Academic Senate and the UCR Graduate Council as set forth in the UC Riverside Graduate Student Application. In addition, **Master's Degree** Applicants should have completed a program equivalent to UCR's B.S. in Electrical Engineering or demonstrate the required knowledge and proficiency in the following subjects:

1. Mathematics, including calculus, differential equations, and complex variables
2. Circuits and electronics (equivalent of EE 100)
3. Signals and systems (equivalent of EE 110)
4. Communication and signal processing (equivalent of EE 115, EE 141)
5. Logic design, digital systems, and microcomputers (equivalent of EE 120)
6. Control systems (equivalent of EE 132)
7. At least one major high-level programming language and associated programming techniques (equivalent of CS 010)

Students with background in other scientific fields are encouraged to apply. Applicants lacking minimum undergraduate preparation in the above areas may be admitted but must take the appropriate undergraduate courses. Under special circumstances, students who have not completed all undergraduate requirements may be admitted provided that the deficiencies are corrected within the first year of graduate study. Courses taken for this purpose do not count towards an advanced degree.

## Master of Science

The Department of Electrical Engineering offers the M.S. degree in Electrical Engineering.

General university requirements are listed in the Graduate Studies section of this catalog. Students may obtain an M.S. degree in Electrical Engineering through either Plan I (Thesis) or Plan II (Comprehensive Examination). The normative time for a student to complete the M.S. degree under both Plan I or Plan II is six quarters (two years). Students who are admitted with deficiencies may require up to three additional quarters.

**Plan I (Thesis)** Students must complete 36 units of graduate or upper-division undergraduate work in Electrical Engineering and other approved subject areas. At least 24 of these units must be in graduate-level courses taken at a campus of the UC, including at least 12 units of required graduate courses. The required and approved courses in each area are determined by the graduate program committee. No more than 12 units may be in graduate research (courses numbered 297 or 299). Upper-division undergraduate courses numbered 125 and above can be counted towards the degree requirements.

A thesis on a research topic must be submitted and approved by the faculty. The thesis must demonstrate the student's in-depth knowledge of the chosen research topic. Publishable results are encouraged. The thesis defense is a two-hour examination session open to the public and begins with a brief presentation of the thesis by the candidate, followed by a question-and-answer session.

**Plan II (Comprehensive Examination)** The same requirements as in Plan I apply, except that students must complete at least 18 quarter units of graduate-level courses taken at a UC campus, and none of these credits can be in courses numbered 297 or 299. A maximum of 6 units can be taken in Directed Studies (290).

Students must take the comprehensive examination. The examination is conducted jointly with the Ph.D. preliminary examination. The examination emphasizes the fundamental knowledge of the study area rather than the specifics covered in individual courses. Candidates must solve at least five problems in at least three different major areas. No more than three problems may be chosen from the student's major area of specialization (i.e., communications and signal processing; control and robotics; intelligent systems; nano materials, devices, and circuits; integrated circuits and VLSI system design.)

**Normative Time to Degree** Six quarters (two years)

## Doctoral Degree

The Department of Electrical Engineering offers the Ph.D. degree in Electrical Engineering.

**Admission** An M.S. or equivalent degree in Electrical Engineering or a related field is nor-

mally required. Exceptional applicants may be admitted directly without an M.S. degree. Students with backgrounds in other scientific fields are encouraged to apply. Applicants lacking undergraduate preparation in the above areas may be admitted but must take the appropriate undergraduate courses. Under special circumstances, students who have not completed all undergraduate requirements may be admitted, provided that the deficiencies are corrected within the first year of graduate study. Courses taken for this purpose do not count towards an advanced degree.

**Course Work** There is no strict course or unit requirement for the Ph.D. degree. The faculty recommends that the student take a minimum of 36 quarter units of 100- or 200-level course work (excluding EE 297 or EE 299) while in graduate standing as evidence of preparation for the doctoral qualifying examination. The courses may include graduate course work used for the M.S. degree.

Students must complete a minimum of six quarters (two years) in residence in the UC with a GPA of 3.00 or better.

Students must submit a formal study plan before the end of the second quarter of academic residency. Initially, the plan lists the student's entire expected program of course work. After passing the preliminary examination, an amended version of the study plan must be submitted to and approved by the student's doctoral committee.

Students must establish a major subject area. A coherent program of approximately 24 units of graduate course work in the major area is recommended. Students may need to take considerably more than the 24 units to prepare for the Ph.D. research. The balance of the courses should lend support to the major field of study while adding breadth to the student's overall program. These courses may consist of Electrical Engineering courses in an area distinctively different from the major area and/or courses from other campus departments.

**Preliminary Examination** The purpose of the preliminary examination is to screen candidates for continuation in the doctoral program. The examination is administered by the graduate program committee and is combined with the M.S. comprehensive examination. Candidates must solve at least five problems in at least three different major areas. No more than three problems may be chosen from the student's major area of specialization (i.e., communications and signal processing; control and robotics; intelligent systems; nano materials, devices, and circuits; integrated circuits and VLSI system design.)

Plan II M.S. candidates who took the combined M.S. comprehensive and Ph.D. preliminary examination and successfully passed at the Ph.D. level are given credit for having passed the Ph.D. preliminary examination.

**Dissertation Proposal and Oral Qualifying Examination** After passing the preliminary

examination, doctoral candidates must prepare and submit a dissertation proposal to their qualifying examination committee before the qualifying examination. The format of the proposal is flexible, but the proposal should clearly indicate the proposed problem under study, demonstrate substantial knowledge of the topic and related issues, state the progress made towards a solution, and indicate the work remaining to be done. The new approaches and methods to be used in the research should also be discussed. An extensive bibliography for the problem under study should be attached to the proposal.

The oral qualifying examination focuses on the dissertation problem. It includes considerable depth in the student's area of specialization, as required for a successful completion of the dissertation. The examination is a three-hour session, which begins with the student's presentation of the dissertation topic and is followed with questions and suggestions by the doctoral committee.

A doctoral dissertation should be an original and substantial contribution to knowledge in the student's major field. It must demonstrate the student's ability to carry out a program of independent advanced research and to report the results in accordance with standards observed in recognized scientific journals.

**Dissertation Examination and Defense** When the doctoral committee determines that a suitable draft of the dissertation has been presented, a dissertation examination and defense for the student is scheduled. The defense consists of a public seminar followed by questions from the committee members and the audience.

**Language Requirement** To meet the degree requirements of the Electrical Engineering program, all admitted Ph.D. students whose native language is not English must take ESL classes until they get a "clear pass" on the TAST or SPEAK test.

**Normative Time to Degree** 12 quarters (15 quarters for students without an M.S. in Electrical Engineering)

## Preparation for Careers in Teaching

All doctoral students are recommended to be employed as teaching assistants for at least three quarters during their graduate career. The department is developing special courses to aid in the learning of effective teaching methods, such as handling discussion/lab sessions and preparing and grading examinations.

Contact the Graduate Student Affairs Assistant at the Department of Electrical Engineering, (951) 827-2484, or visit [ee.ucr.edu](http://ee.ucr.edu) for information on graduate courses.

## Lower-Division Courses

**EE 001A. Engineering Circuit Analysis I (3)** Lecture, 3 hours. Prerequisite(s): MATH 046, PHYS 040C (both

may be taken concurrently); concurrent enrollment in EE 01LA. Ohm's law and Kirchoff's laws; nodal and loop analysis; analysis of linear circuits; network theorems; transients in RLC circuits. Application of SPICE to circuit analysis.

**EE 001B. Engineering Circuit Analysis II (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 001A and EE 01LA. Sinusoidal steady state analysis, polyphase circuits, magnetically coupled networks, frequency characteristics, Laplace and Fourier transforms, Laplace and Fourier analysis. Application of SPICE to complicated circuit analysis.

**EE 002. Electrical and Electronic Circuits (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PHYS 040C (may be taken concurrently). Intended for non-Electrical Engineering majors for whom knowing the design of electrical and electronic circuits is not crucial but is helpful. Involves direct-circuit calculations with resistors, inductors, and capacitors, followed by steady state sinusoidal analysis. Discusses logic circuits before electronics, which includes diodes, amplifiers, and transistors.

**EE 010. Introduction to Electrical Engineering (2)** Laboratory, 3 hours; lecture, 1 hour. Prerequisite(s): none. Introduces common everyday electrical engineering and technology devices. Aims to enrich students' appreciation of technology and the application of simple science and engineering concepts in the design and operation of these electrical and electronic devices, and to provide students with an early positive engineering experience and interaction with departmental faculty. Graded Satisfactory (S) or No Credit (NC).

**EE 01LA. Engineering Circuit Analysis I Laboratory (1)** Laboratory, 3 hours. Prerequisite(s): EE 001A (may be taken concurrently). Laboratory experiments closely tied to the lecture material of EE 001A: resistive circuits, attenuation and amplification, network theorems and superposition, operational amplifiers, transient response, application of SPICE to circuit analysis.

**EE 020. Linear Methods for Engineering Analysis and Design Using MATLAB (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 008B or MATH 009A or MATH 09HA. Introduces MATLAB programming and linear methods for circuit and system analysis and optimization. Topics include formulating circuit problems as linear systems of equation; methods for finding their solutions; phasors for AC analysis; vector and matrix representations of signals and systems; matrices computations; and linear programming for system analysis and design.

## Upper-Division Courses

**EE 100A. Electronic Circuits (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 001B. Electronic systems, linear circuits, operational amplifiers, diodes, nonlinear circuit applications, junction and metal-oxide-semiconductor field-effect transistors, bipolar junction transistors, MOS and bipolar digital circuits. Laboratory experiments are performed in the subject areas and SPICE simulation is used.

**EE 100B. Electronic Circuits (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 100A. Differential and multistage amplifiers, output stages and power amplifiers, frequency response, feedback, analog integrated circuits, filters, tuned amplifiers, and oscillators. Laboratory experiments are performed in the subject areas and SPICE simulation is used.

**EE 105. Modeling and Simulation of Dynamic Systems (4)** Lecture, 3 hours; laboratory, 3 hours.

Prerequisite(s): CS 010, EE 001A, MATH 046. Introduction to the mathematical modeling of dynamical systems and their methods of solution. Advanced techniques and concepts for analytical modeling and study of various electrical, electronic, and electro-mechanical systems based upon physical laws. Emphasis on the formulation of problems via differential equations. Numerical methods for integration and matrix analysis problems. Case studies. Digital computer simulation.

**EE 110A. Signals and Systems (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 010; EE 001B (may be taken concurrently); MATH 046. Basic signals and types of systems, linear time-invariant (LTI) systems, Fourier analysis, frequency response, and Laplace transforms for LTI systems. Laboratory experiments with signals, transforms, harmonic generation, linear digital filtering, and sampling/aliasing.

**EE 110B. Signals and Systems (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110A. Fourier analysis for discrete-time signals and systems, filtering, modulation, sampling and interpolation, z-transforms. Laboratory experiments with signals, transforms, harmonic generation, linear digital filtering, and sampling/aliasing.

**EE 114. Probability, Random Variables, and Random Processes in Electrical Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 110A. Covers fundamentals of probability theory, random variables, and random processes with applications to electrical and computer engineering. Includes probability theory, random variables, densities, functions of random variables, expectations and moments, and multivariate distributions. Also addresses random processes, autocorrelation function, spectral analysis of random signals, and linear systems with random inputs.

**EE 115. Introduction to Communication Systems (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110B. Covers spectral density and correlation, modulation theory, amplitude, frequency, phase and analog pulse modulation and demodulation techniques, signal-to-noise ratios, and system performance calculations. Laboratory experiments involve techniques of modulation and demodulation.

**EE 116. Engineering Electromagnetics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 001B (may be taken concurrently). Transmission lines, fields and field operators, electrostatic and magnetostatic fields, time-varying fields, electrodynamics, electromagnetic waves, plane waves, guided waves, and applications to engineering problems.

**EE 117. Electromagnetics II (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 116. Applications of Maxwell's equations. Skin effect, boundary-value problems, plane waves in lossy media, transverse EM waves, hollow metal waveguides, cavity resonators, microstrips, propagation in dielectrics and optical fibers, optical fibers applications, radiation, and antennas. Laboratory work involves both software simulations and hardware experiments in basic electromagnetic technology.

**EE 120A. Logic Design (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 061 with a grade of "C-" or better. Covers the design of digital systems. Topics include Boolean algebra; combinational and sequential logic design; design and use of arithmetic logic units, carry-lookahead adders, multiplexers, decoders, comparators, multipliers, flip-flops, registers, and simple memories; state-machine design; and basic register-transfer level design. Interdisciplinary laboratories involve use of hardware description lan-

guages, synthesis tools, programmable logic, and significant hardware prototyping. Cross-listed with CS 120A.

**EE 120B. Introduction to Embedded Systems (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 120A/EE 120A. Introduction to hardware and software design of digital computing systems embedded in electronic devices (such as digital cameras or portable video games). Topics include embedded processor programming, custom processor design, standard peripherals, memories, interfacing, and hardware/software tradeoffs. Interdisciplinary laboratory involves use of synthesis tools, programmable logic, and microcontrollers and development of working embedded systems. Cross-listed with CS 120B.

**EE 123. Power Electronics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 100B with a grade of "D-" or better. Covers the study of power semiconductor devices. Includes magnetic circuits and components; switch mode converters and power supplies; and single, three-phase, pulse width modulation, and resonant pulse inverters. Addresses voltage controllers; direct current and induction motor drives; and design of motion control drive circuits for robotic and industrial automation systems.

**EE 128. Data Acquisition, Instrumentation, and Process Control (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 120A/EE 120A, EE 100B; or consent of instructor. Analog signal transducers, conditioning and processing; step motors, DC servo motors, and other actuation devices; analog to digital and digital to analog converters; data acquisition systems; microcomputer interfaces to commonly used sensors and actuators; design principles for electronic instruments, real time process control and instrumentation.

**EE 132. Automatic Control (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 105 or ME 103 or equivalent; EE 110A or ENGR 118; or consent of instructor. Covers mathematical modeling of linear systems for time and frequency domain analysis. Topics include transfer function and state variable representations for analyzing stability, controllability, and observability; and closed-loop control design techniques by Bode, Nyquist, and root-locus methods. Laboratories involve both simulation and hardware exercises.

**EE 133. Solid-State Electronics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 100A. Presents the fundamentals of solid-state electronics. Topics include electronic band structure, Fermi and quasi-Fermi levels; doping; contacts; junctions; field-effect, bipolar, and metal-oxide-semiconductor (MOS) transistors; and charge-coupled devices. Also reviews device fabrication concepts.

**EE 134. Digital Integrated Circuit Layout and Design (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 120A/EE 120A, EE 001A, EE 001B, EE 100A, EE 100B, EE 133. Covers integrated circuit design, layout, and verification of complementary metal oxide semiconductors (CMOSs) with use of computer-aided design tools. Topics covered are digital models, inverters, static logic gates, transmission gates, flip-flops, dynamic logic gates, memory circuits, and digital phase-locked loops.

**EE 135. Analog Integrated Circuit Layout and Design (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 001A, EE 001B, EE 100A, EE 100B, EE 133, EE 134. Covers analog circuit design, layout, and verification of complementary metal oxide semiconductors (CMOSs) with use of computer-aided design tools. Topics covered are analog metal oxide semiconductor field effect transistor (MOSFET) models, current sources, references, amplified design,

nonlinear analog circuits, dynamic analog circuits, analog-to-digital converters (ADCs), and digital-to-analog converters (DACs).

**EE 136. Semiconductor Device Processing (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 133 or equivalent. Presents device simulations and hands-on experience in integrated-circuit fabrication techniques and device characterization. Using four-mask metal-oxide semiconductor (MOS) technology, students fabricate resistors, junctions, capacitors, and MOS transistors and perform electrical evaluation.

**EE 137. Introduction to Semiconductor Optoelectronic Devices (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 133. An introduction to semiconductor optoelectronic devices for optoelectronic communications and signal processing. Topics include basic optical processes in semiconductors, semiconductor light-emitting diode, semiconductor heterojunction lasers, photodetectors, solar cells, optoelectronic modulation, and switching devices.

**EE 138. Electrical Properties of Materials (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing; PHYS 040C or equivalent. Introduces the electrical properties of materials. Includes the electron as a particle and a wave; hydrogen atom and the periodic table; chemical bonds; free-electron theory of metals; band theory of solids; semiconductors and dielectrics; measurements of material properties; and growth and preparation of semiconductors.

**EE 139. Magnetic Materials (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing; PHYS 040C or equivalent. Introduces fundamentals of magnetic materials for the next-generation magnetic, nanomagnetic, and spintronics-related technologies. Includes basics of magnetism, models of the equivalent magnetic charge and current, paramagnetic and diamagnetic materials, soft and hard magnetic materials, equivalent magnetic circuits, and magnetic system design foundations.

**EE 140. Computer Visualization (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): senior standing in Computer Engineering, Computer Science, or Electrical Engineering. Introduction to visual perception and thinking, fundamentals of three-dimensional geometrical transformations, camera models, perspective transformation, illumination and color models, ray tracing, representations of three-dimensional shape, texture, motion and shading, and rendering and animation. Laboratories on visual realism methods cover three-dimensional modeling, viewing, and rendering.

**EE 141. Digital Signal Processing (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110B. Transform analysis of Linear Time-Invariant (LTI) systems, discrete Fourier Transform (DFT) and its computation, Fourier analysis of signals using the DFT, filter design techniques, structures for discrete-time systems. Laboratory experiments on DFT, fast Fourier transforms (FFT), infinite impulse response (IIR), and finite impulse response (FIR) filter design, and quantization effects.

**EE 143. Multimedia Technologies and Programming (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 010. Introduces multimedia technologies and programming techniques, multimedia hardware devices, authoring languages and environments, temporal and nontemporal media (interactivity in text, graphics, audio, video, and animation), applications, and trends. Requires a term project. Cross-listed with CS 143.

**EE 144. Introduction to Robotics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 132. Basic robot components from encoders to microprocessors. Kinematic and dynamic analysis of manipulators. Open- and closed-loop control strategies, task planning, contact and noncontact sensors, robotic image understanding, and robotic programming languages. Experiments and projects include robot arm programming, robot vision, and mobile robots.

**EE 146. Computer Vision (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): senior standing in Computer Science or Electrical Engineering, or consent of instructor. Imaging formation, early vision processing, boundary detection, region growing, two-dimensional and three-dimensional object representation and recognition techniques. Experiments for each topic are carried out.

**EE 150. Digital Communications (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 114, EE 115. Topics include modulation, probability and random variables, correlation and power spectra, information theory, errors of transmission, equalization and coding methods, shift and phase keying, and a comparison of digital communication systems.

**EE 151. Introduction to Digital Control (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 132, EE 141. Review of continuous-time control systems; review of Z-transform and properties; sampled-data systems; stability analysis and criteria; frequency domain analysis and design; transient and steady-state response; state-space techniques; controllability and observability; pole placement; observer design; Lyapunov stability analysis. Laboratory experiments complementary to these topics include simulations and hardware design.

**EE 152. Image Processing (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110B. Digital image acquisition, image enhancement and restoration, image compression, computer implementation and testing of image processing techniques. Students gain hands-on experience of complete image processing systems, including image acquisition, processing, and display through laboratory experiments.

**EE 153. Electric Drives (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 123 with a grade of D- or better, EE 116 with a grade of D- or better. Covers the study of electro-mechanical energy conversion; magnetic circuits and components; electric motors; and direct current, induction, and reluctance motor drives. Also addresses servomechanism analysis and design of feedback controllers; energy efficiency; and drive-by-wire, robotic, and industrial automation systems.

**EE 160. Fiber-Optic Communication Systems (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 115, EE 116. An introduction to fiber-optic communication systems. Topics include optical fiber transmission, optical amplifiers, transmitters, receivers, and wavelength-division multiplexing.

**EE 162. Introduction to Nanoelectronics (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): EE 133 or consent of instructor; familiarity with MATLAB or equivalent and with basic matrix algebra is recommended. Presents the basic concepts of nanoelectronics with a focus on current flow through nanostructured devices. Topics include new paradigms of nanoelectronics, an atomistic view of electrical resistance, Schrodinger's equation, Coulomb blockade, basis functions, bandstructure, quantum capacitance, level broadening, and coherent transport.

**EE 165. Design for Reliability of Integrated Circuits and Systems (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 100A; senior or graduate standing or consent of instructor. Covers essentials of electrical transient induced failures to integrated circuits (IC) and systems. Addresses basics for different failure and testing models including electrostatic discharge (ESD). Discusses design-for-reliability (DFR) techniques such as ESD protection designs at IC, module, and system levels. Enhances learning with computer aided design (CAD) laboratories.

**EE 175A. Senior Design Project (4)** Consultation, 1 hour; lecture, 1 hour; laboratory, 6 hours. Prerequisite(s): ENGR 180W, senior standing in Electrical Engineering. The proposal and design of electrical engineering devices or systems under the direction of a faculty member. Emphasizes professional and ethical responsibilities, as well as the need to stay current on technology and its global impact on economics, society, and the environment. Graded In Progress (IP) until EE 175A and EE 175B are completed, at which time a final, letter grade is assigned.

**EE 175B. Senior Design Project (4)** Consultation, 1 hour; lecture, 1 hour; laboratory, 6 hours. Prerequisite(s): EE 175A, senior standing in Electrical Engineering. Under the direction of a faculty member, students (individually or in small teams with shared responsibilities) build, test, and redesign electrical engineering devices or systems. Requires a written report and an oral presentation of the design aspects. Satisfactory (S) or No Credit (NC) grading is not available.

**EE 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

**EE 191 (E-Z). Seminar in Electrical Engineering (1-4)** Seminar, 2-8 hours. Prerequisite(s): upper-division standing or consent of instructor. Additional prerequisites may be required for some segments of this course; see department. Consideration of current topics in electrical engineering. Offered in summer only.

**EE 194. Independent Reading (1-2)** Extra reading, 3-6 hours. Prerequisite(s): upper division standing or consent of instructor. Independent reading in material not covered in course work. Normally taken in senior year. Course is repeatable to a maximum of 4 units.

**EE 197. Research for Undergraduates (1-4)** Outside research, 3-12 hours. Prerequisite(s): consent of instructor and Electrical Engineering undergraduate program advisor. Directed research on a topic relevant to electrical engineering. Requires a final written report. Course is repeatable to a maximum of 8 units.

**EE 198-I. Individual Internship in Electrical Engineering (1-12)** Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): upper-division standing; at least 12 units in Electrical Engineering. Provides the undergraduate student with career experience as an electrical engineer in an industry or a research unit under the joint supervision of an off-campus sponsor and a faculty member in Electrical Engineering. Each individual program must have the prior approval of both supervisors. Requires a final report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

## Graduate Courses

**EE 201. Applied Quantum Mechanics (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s):

MATH 046, PHYS 040A; or consent of instructor.

Covers topics in quantum mechanics including Schrodinger equation; operator formalism; harmonic oscillator; quantum wells; spin, bosons, and fermions; solids; perturbation theory; Wentzel-Kramers-Brillouin approximation; tunneling; tight-binding model; quantum measurements; quantum cryptography; and quantum computing. Cross-listed with MSE 207.

**EE 202. Fundamentals of Semiconductors and Nanostructures (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 133, EE 201/MSE 207; or consent of instructor. Examines principles of semiconductor materials and nanostructures. Topics include periodic structures, electron and phonon transport, defects, optical properties, and radiative recombination. Also covers absorption and emission of radiation in nanostructures and nonlinear optics effects. Emphasizes properties of semiconductor superlattices, quantum wells, wires, and dots. Cross-listed with MSE 217.

**EE 203. Solid-State Devices (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 133 or consent of instructor. Covers electronic devices including p-n junctions, field-effect transistors, heterojunction bipolar transistors, and nanostructure devices. Explores electrical and optical properties of semiconductor heterostructures, superlattices, quantum wires, and dots, as well as devices based on these structures. Cross-listed with MSE 237C.

**EE 204. Advanced Electromagnetics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 117 or consent of instructor. Presents selected topics in electromagnetic theory and antenna design. Topics include power transmission and attenuation in microstrip transmission lines (TL) and waveguides (WG); transient analysis and applications of TL and WG; radiation of electromagnetic waves; antenna design; electromagnetic interference and compatibility; and numerical methods in electromagnetic theory.

**EE 205. Optoelectronics and Photonic Devices (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 203/MSE 237C, EE 204; or consent of instructor. A study of the physical optical and photonic devices and their use in an optical communication system. Covers silica fibers, light-emitting diodes (LEDs), heterojunction lasers, p-i-n photodiodes, and avalanche photodiodes.

**EE 206. Nanoscale Characterization Techniques (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 201/MSE 207, EE 202/MSE 217, EE 203/MSE 237C; or consent of instructor. An in-depth study of nanoscale materials and device characterization techniques. Laboratory emphasizes atomic force microscopy (AFM) and scanning tunneling microscopy (STM). Topics include semiconductor fabrication fundamentals; metrology requirements; in situ monitoring; interconnects and failure analysis; principles of AFM, STM, and scanning electron microscopy; X-ray methods; optical and infrared techniques; and electrical characterization. Cross-listed with MSE 227.

**EE 207. Noise in Electronic Devices (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 203/MSE 237C or consent of instructor. A study of fluctuation processes in solids and noise in electronic devices. Topics include the theory of random processes and analysis of noise types such as generation-recombination noise, low-frequency noise, random telegraph noise, thermal noise, and shot noise.

**EE 208. Semiconductor Electron, Phonon, and Optical Properties (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 202/MSE 217. Topics include semiconductor electronic band structure theory and methods; phonon dispersion theory and methods; defects in semiconductors; and optical properties of

semiconductors. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 209. Semiclassical Electron Transport (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 201/MSE 207, EE 203/MSE 237C, EE 208. Covers the Boltzmann transport equation as applied to semiconductor device modeling. Topics include the physics of carrier scattering in common semiconductors, theoretical treatments of low and high field transport, balance equations, and Monte Carlo solutions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 210. Advanced Digital Signal Processing (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 110B, EE 141. Provides in-depth coverage of advanced techniques for digital filter and power spectral estimation. Topics include digital filter design, discrete random signals, finite-wordlength effects, non-parametric and parametric power spectrum estimation, multirate digital signal processing, least square methods of digital filter design, and digital filter applications.

**EE 211. Adaptive Signal Processing (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 210, EE 215. Provides an in-depth understanding of adaptive signal processing techniques. Covers Wold decomposition; Yule-Walker equations; spectrum estimation; Weiner filters; linear prediction; Kalman filtering; time-varying system tracking; nonlinear adaptive filtering; and performance analysis of adaptive algorithms and their variations including stochastic gradient, least mean square, least squares, and recursive least squares.

**EE 212. Quantum Electron Transport (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 208. Covers the theory and methods used to model quantum electron transport in ultrascaled traditional semiconductor devices such as transistors, nanoscaled research semiconductor devices (such as quantum dots), and novel electronic material systems (such as carbon nanotubes and molecular wires.) May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 213. Computer-Aided Electronic Circuit Simulation (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 001A, EE 001B, EE 133. Introduction to numerical algorithms and computer-aided techniques for the simulation of electronic circuits. Covers theoretical and practical aspects of important analyses. Topics include circuit formulation methods; large-signal nonlinear direct current, small-signal alternating current, and moment-matching transient; sensitivity; and noise. Also discusses recent advances in timing analysis, symbolic analysis, and radio frequency circuit analysis.

**EE 214. Quantum Computing (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 201/MSE 207 or equivalent; graduate standing or consent of instructor. An introduction to quantum computing. Topics include qubits, entanglement, quantum gates, quantum circuit diagrams, simple quantum algorithms, quantum teleportation, quantum cryptography, Shor's factorization algorithm, Grover's search algorithm, and quantum error correction.

**EE 215. Stochastic Processes (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. A study of probability theory and stochastic processes, with a focus on the most fundamental aspect of modern communication, control, and signal processing systems driven by random signal inputs. Topics include random variables and stochastic processes; spectral analysis; Wiener opti-

mum filter, matched filter, and Karhunen-Loeve expansion; mean square estimation theory including smoothing, filtering, and linear prediction; Levinson's algorithm, lattice filters, and Kalman filters; and the Markov process.

**EE 216. Nanoscale Phonon Engineering (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 202/MSE 217. Studies acoustic and optical phonons that affect electrical, thermal, and optical properties of materials. Focuses on the confinement-induced changes of phonon properties in nanostructures and their implications for performance of electronic, thermoelectric, and optoelectronic devices. Explores phonon theory, Raman spectroscopy and other phonon characterization techniques, thermal conductivity, and related measurements. Cross-listed with MSE 237B.

**EE 219. Advanced Complementary Metal Oxide Semiconductor (CMOS) Technology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 203/MSE 237C. Introduces advanced complementary metal oxide semiconductor (CMOS) technology. Topics include MOS field effect transistor (MOSFET) scaling; short and narrow channel effects; high field effects; vertical MOSFET transistors; single electron transistors; MOSFET nonvolatile memory devices; and small- and large-signal MOSFET models. Covers CMOS process integration.

**EE 220. Applied Ferromagnetism (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 116; consent of instructor. Introduces fundamentals of ferromagnetism necessary to develop next-generation nanomagnetic and spintronics-related devices. Includes basics of magnetism, magnetic circuits, ferromagnetic resonance (FMR), nuclear magnetic resonance (NMR), spintronics, and analyses of applications. Cross-listed with MSE 237A.

**EE 221. Radio-Frequency Integrated Circuit Design (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 100B; senior or graduate standing. Covers the essentials of contemporary radio frequency (RF) complementary metal oxide semiconductor (CMOS) integrated circuit (IC) analysis and design. Addresses typical RF building blocks in CMOS and bipolar/CMOS (BiCMOS) technologies, including passive IC components, transistors, distributed networks, voltage reference and biasing circuits, power amplifiers, and feedback networks. Also covers RF device modeling, bandwidth estimation, and stability analysis techniques.

**EE 222. Advanced Radio-Frequency (RF) Integrated Circuit Design (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 100B; senior or graduate standing. Covers analysis techniques for nonlinear effects and noise in RF integrated circuit design. Addresses nonlinear, and distortion behavior, including inter-modulation, cross-modulation, harmonics, gain compression, and desensitization. Also explores noise effects, including thermal, shot, flicker, and burst noises. Includes single-stage and multiple-stage networks.

**EE 223. Numerical Analysis of Electromagnetic Devices (4)** Lecture, 4 hours. Prerequisite(s): EE 117, MATH 151C. Covers in depth the numerical and mathematical foundations of the contemporary computer modeling techniques used in the design and analysis of electromagnetic devices and systems. Provides hands-on experience in modeling systems such as radio frequency devices, magnetic systems, and electromagnetic motors.

**EE 224. Digital Communication Theory and Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 115; either the MATH 149A and MATH 149B

sequence or the STAT 160A and STAT 160B sequence; or equivalents. Provides an overview of basic communication techniques and an introduction to optimum signal detection and correction. Topics include sampling and bandwidth; pulse code modulation; line coding and pulse shaping; delta modulation; stochastic approach to bandwidth and noise corruption; white Gaussian noise; matched filter; optimum signal detection; Shannon theorem; and error correction.

**EE 225. Error-Correcting Codes (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215 or consent of instructor. Provides an overview of basic error-correcting techniques used in data transmission and storage. Topics include groups and Galois fields, error-correction capability and code design of Hamming codes, cyclic codes, Bose-Chaudhuri-Hocquengem (BCH) codes, and Reed-Solomon codes. Also considers concatenated design and decoding techniques.

**EE 226. Wireless Communications (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215, EE 224. Presentation of fundamental cellular concepts and new techniques in wireless communications. Topics include cellular systems and standards, frequency reuse, system capacity, channel allocation, cellular radio propagation, fading channel modeling and equalization, spread spectrum communications and other multiple access techniques, and wireless networking.

**EE 227. Spread Spectrum Communications (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 115, EE 215; or consent of instructor. Provides an overview of spread spectrum communication techniques. Topics include direct sequence, frequency hopping and hybrid spread spectrum, pseudorandom sequence generation, modulation and spreading, code tracking, carrier synchronization, coherent and noncoherent data demodulation over fading channels, direct sequence multiple access, and performance evaluation of various multiuser detectors. **Xu**

**EE 228. Fundamentals of Data Compression (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 215 (may be taken concurrently). Covers the fundamental theory and tools for designing data and signal compression systems. Topics include lossless coding, scalar quantization, predictive and transform coding techniques, vector quantization, and the general trade-off between the reproduction signal quality and the bit-rate of the digital representation. Provides a foundation for further study and research in speech, audio, image, and video compression.

**EE 229. Video Processing and Communication (4)** Lecture, 3 hours; laboratory, 1 hour; extra reading, 2 hours. Prerequisite(s): EE 150, EE 210. Covers the fundamental principles and technologies in the compression and transmission of coded video streams over wired and wireless networks, including wireless network protocols, compression standards, digital signal processor architectures, network or traffic management, quality of service, rate control schemes, and error resilience.

**EE 230. Mathematical Methods for Electrical Engineers (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers fundamental theoretical concepts and computational tools for Electrical Engineering graduate students. Presents material relevant to electrical engineering applications. Topics include vector spaces; partitioned, unitary, and positive definite matrices; differential calculus with matrices; matrix decompositions; linear system solution; convex optimization; the Lagrangian method; KKT conditions; and nonlinear optimization methods. May be taken

Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 235. Linear System Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 132, MATH 113. Provides a review of linear algebra. Topics include the mathematical description of linear systems; the solution of state-space equations; controllability and observability; canonical and minimal realization; and state feedback, pole placement, observer design, and compensator design.

**EE 236. State and Parameter Estimation Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215. Covers auto-regressive and moving-average models; state estimation and parameter identification (including least square and maximum likelihood formulations); observability theory; synthesis of optimum inputs; Kalman-prediction (filtering and smoothing); steady-state and frequency domain analysis; online estimation; colored noise; and nonlinear filtering algorithms.

**EE 237. Nonlinear Systems and Control (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 235. Explores nonlinear systems and control. Topics include nonlinear differential equations, second order nonlinear systems, equilibrium and phase portrait, limit cycle, harmonic analysis and describing function, Lyapunov stability theory, absolute stability, Popov and circle criterion, input-output stability, small gain theorem, averaging methods, and feedback linearization.

**EE 238. Linear Multivariable Control (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 235. Investigates multivariable feedback systems, stability, performance, uncertainty, and robustness. Topics include analysis and synthesis via matrix factorization; Q-parameterization and all stabilizing controllers; frequency domain methods; and H(infinity) design and structured singular value analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 239. Optimal Control (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215, EE 235. Presents the theory of stochastic optimal control systems and methods for their design and analysis. Covers principles of optimization; Lagrange's equation; linear-quadratic-Gaussian control; certainty-equivalence; the minimum principle; the Hamilton-Jacobi-Bellman equation; and the algebraic Riccati equation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 240. Pattern Recognition (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 141 or consent of instructor. Covers basics of pattern recognition techniques. Topics include hypothesis testing, parametric classifiers, parameter estimation, nonparametric density estimation, nonparametric classifiers, feature selection, discriminant analysis, and clustering.

**EE 241. Advanced Digital Image Processing (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 152 or consent of instructor. Covers advanced topics in digital image processing. Examines image sampling and quantization, image transforms, stochastic image models, image filtering and restoration, and image data compression.

**EE 242. Intelligent Systems (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces fundamental concepts of design of intelligent systems. Topics include biological versus computational systems, knowledge representation, computational reasoning, computational learning, language and human-

machine communication, expert systems, computational vision, and examples of intelligent machines.

**EE 243. Advanced Computer Vision (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 146 or consent of instructor. A study of three-dimensional computer vision. Topics include projective geometry, modeling and calibrating cameras, representing geometric primitives and their uncertainty, stereo vision, motion analysis and tracking, interpolating and approximating three-dimensional data, and recognition of two-dimensional and three-dimensional objects.

**EE 244. Computational Learning (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores fundamental computational learning techniques. Topics include elements of learning systems, inductive learning, analytic learning, case-based learning, genetic learning, connectionist learning, reinforcement learning and integrated learning techniques, and comparison of learning paradigms and applications.

**EE 245. Advanced Robotics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 236; ME 120 or equivalent. Topics include robot navigation; description of robot sensors and their characteristics; sensor data processing; feature extraction; and matching. Also covers representations of space for mapping; map-based localization; simultaneous localization and mapping; image-based motion estimation; and motion planning. Cross-listed with ME 222.

**EE 246. Intelligent Transportation Systems (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. EE 115 and EE 132 are recommended. Focuses on the control, communications, and computer aspects of intelligent transportation systems. Topics include traffic flow theory fundamentals, intelligent transportation system user services, travel and traffic management, advanced vehicle safety systems, intelligent transportation system applications, architectures, standards, strategic needs assessment and deployment, and evaluation.

**EE 247. Current Topics in Computer Vision and Pattern Recognition (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 240 or EE 243 or consent of instructor. Topics include advanced methods in computer vision and pattern recognition that are evolving and of current interest. May cover novel mathematical tools; analysis of large video databases; machine learning approaches in video computing; camera networks; and biological applications of computer vision. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 248. Computer-Aided Logic Synthesis for Digital Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 120A/EE 120A. Introduces fundamental theory and techniques for design and analysis of digital circuits. Provides detailed understanding of basic logic synthesis and analysis algorithms. Presents combinational circuit optimization (two-level and multilevel synthesis), sequential circuit optimization (state encoding and retiming), timing analysis, testing, logic verification, and low paper design techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 250. Information Theory (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): EE 215. An overview of fundamental limitations imposed on communication systems. Topics include Shannon's information measures, weak and strong typicality, lossless data compression, source and channel models and Shannon's coding theorems, channel capacity and the rate-dis-

tion function, Gaussian sources and channels, and limits of communication between multiple terminals.

**EE 251. Algorithmic and Combinatorial Coding Theory (4)** Seminar, 2 hours; lecture, 2 hours.

Prerequisite(s): EE 225 or consent of instructor. Explores combinatorial and algorithmic techniques in coding theory. Covers algebraic design of Bose-Chaudhuri-Hocquenghem (BCH) codes and Reed-Muller codes. Algorithmic topics include gradient-like decoding, split-syndrome techniques, and information-set decoding. Introduces decoding with polynomial complexity based on Bayesian estimation, iterative decoding, and codes on graphs. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 259. Colloquium in Electrical Engineering (1)**

Colloquium, 1 hour. Prerequisite(s): graduate standing. Lectures on current research topics in electrical engineering presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EE 260. Seminar in Electrical Engineering (1-4)**

Seminar, 1-4 hours. Prerequisite(s): consent of instructor. Seminar on current research topics in electrical engineering, including areas such as signal processing, image processing, control, robotics, intelligent systems, computer vision, and pattern recognition. Course is repeatable to a maximum of 16 units.

**EE 270. Introduction to Video Bioinformatics (3)**

Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to video bioinformatics. Includes microscopic techniques, live imaging, video computing, structure and function of cells, spatiotemporal dynamics, multi-scale analysis, disk and data storage, indexing and queries, image and video databases, and medical imaging and analysis techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 271. Video Bioinformatics: Multi-scale Analysis of Biological Systems (2)** Lecture, 2 hours.

Prerequisite(s): graduate standing or consent of instructor. Introduces the significant range for both the time and spatial scales of biological systems. Includes video imaging techniques, as well as how these spatial and time scales are analyzed for a better understanding of biological function. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BIEN 271.

**EE 272. Introduction to Imaging Bioinstrumentation and Analysis (2)** Lecture, 1 hour; laboratory, 3 hours; extra reading, 2 hours. Prerequisite(s): graduate standing or consent of instructor.

An introduction to the instrumentation used to collect video images of cells and the methods used to analyze video data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 273. Live Imaging and Analysis of Cellular and Molecular Behaviors (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): EE 272 or consent of instructor.

An introduction to video imaging methodologies used to capture the cellular and molecular dynamics and interactions in living cells. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 274. Introduction to Medical Imaging and Analysis (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor.

An introduction to medical imaging. Includes associated computational techniques for x-ray imaging, computed tomography, magnetic resonance imaging, positron emission tomography, ultra-

sound, radiotherapy, and molecular imaging. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 275. Project in Video Bioinformatics (2)** Lecture, 1 hour; laboratory, 4 hours. Prerequisite(s): graduate standing; consent of instructor.

Explores video bioinformatics research techniques. Emphasizes critical thinking and advanced planning and understanding of hypothesis, computational approaches, and experimental tradeoffs. Includes an interdisciplinary video bioinformatics research project. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**EE 276. Colloquium in Video Bioinformatics (1)**

Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers current research topics in video bioinformatics. Includes presentations by faculty members and visiting researchers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EE 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and Graduate Advisor.

Individual study, directed by a faculty member, of selected topics in electrical engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**EE 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor.

Research conducted under the supervision of a faculty member on selected problems in electrical engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**EE 298-I. Individual Internship in Electrical Engineering (1-12)** Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): graduate standing; consent of instructor.

Provides the Electrical Engineering graduate student with career experience as an electrical engineer in an industry or a research unit. Includes fieldwork with an approved professional individual or organization and academic work under the direction of a faculty member. Requires a final report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**EE 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor.

Research in electrical engineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Engineering

**Subject abbreviation: ENGR**  
**The Marlan and Rosemary Bourns**  
**College of Engineering**

Advising Office, A159 Bourns Hall  
 (951) 827-ENGR (3647);  
[student.engr.ucr.edu](http://student.engr.ucr.edu)

Courses in Engineering are a multidisciplinary approach to providing students with training in concepts common to multiple engineering fields. The courses support the undergraduate programs in all disciplines in the Marlan and Rosemary Bourns College of Engineering. Refer to these programs in this section of the catalog for information on course application.

## Lower-Division Courses

**ENGR 001 (E-Z). Professional Development and Mentoring (1)** Activity, 30 hours per quarter.

Prerequisite(s): freshman standing in the Bourns College of Engineering. Provides freshmen with involvement in professional development activities. Activities to be performed are program-specific, and may include projects, industry overviews and interactions, involvement with professional societies and clubs, team building, career guidance, and coverage of ethics and lifelong learning issues. E. Bioengineering; F. Chemical Engineering; G. Computer Engineering; I. Computer Science; J. Electrical Engineering; K. Environmental Engineering; M. Information Systems.

**ENGR 002 (E-Z). Professional Development and Mentoring (1)** Activity, 30 hours per quarter.

Prerequisite(s): sophomore standing in the Bourns College of Engineering. Provides sophomores with involvement in professional development activities. Activities to be performed are program-specific, and may include projects, industry overviews and interactions, involvement with professional societies and clubs, team building, career guidance, and coverage of ethics and lifelong learning issues. E. Bioengineering; F. Chemical Engineering; G. Computer Engineering; I. Computer Science; J. Electrical Engineering; K. Environmental Engineering; M. Information Systems.

**ENGR 010. Introduction to Engineering (2)** Discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): none.

Introduction to and experience with common everyday engineering and technology devices. Aims to enrich students' appreciation of technology and the application of simple science and engineering concepts in the design and operation of these devices, and to provide students with an early positive engineering experience and interaction with College of Engineering faculty. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of ENGR 010 or ME 001A.

**ENGR 060. Engineering Economics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009A.

Covers economic decisions involving engineering alternatives. Topics include time value of money, annual cost, present worth, rate of return, and benefit-to-cost. Addresses before and after tax replacement economy, organizational financing, break-even analysis, risk analysis, and capital budgeting. Cross-listed with ECON 060.

**ENGR 092. First-Year Seminar in Engineering (1)**

Seminar, 10-15 hours per quarter. Prerequisite(s): Freshman standing. Enrollment priority is given to freshmen, but sophomores may enroll on a space-available basis with consent of instructor. Introduction to one of the many areas of study explored by the faculty of the College of Engineering in a small-group, highly interactive format. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 3 units of any combination of ENGR 092, HASS 092, and NASC 092; students may enroll in only 1 unit of ENGR 092, HASS 092, or NASC 092 per quarter.

## Upper-Division Courses

**ENGR 101 (E-Z). Professional Development and Mentoring (1)** Activity, 30 hours per quarter.

Prerequisite(s): junior standing in the Bourns College of Engineering. Provides juniors with involvement in professional development activities. Activities to be performed are program-specific, and may include projects, industry overviews and interactions, involve-

ment with professional societies and clubs, team building, career guidance, and coverage of ethics and lifelong learning issues. E. Bioengineering; F. Chemical Engineering; G. Computer Engineering; I. Computer Science; J. Electrical Engineering; K. Environmental Engineering; M. Information Systems.

#### **ENGR 102 (E-Z). Professional Development and Mentoring (1)** Activity, 30 hours per quarter.

Prerequisite(s): senior standing in the Bourns College of Engineering. Provides seniors with involvement in professional development activities. Activities to be performed are program-specific, and may include projects, industry overviews and interactions, involvement with professional societies and clubs, team building, career guidance, and coverage of ethics and lifelong learning issues. E. Bioengineering; F. Chemical Engineering; G. Computer Engineering; I. Computer Science; J. Electrical Engineering; K. Environmental Engineering; M. Information Systems.

#### **ENGR 108. Technology in Premodern Civilizations (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines relations between society, machine, and state in ancient China, Greece, Rome, and medieval Europe. Focuses on key mechanical and civil technologies and the role of the state in differentiating their development between the four historic civilizations. Cross-listed with HIST 108.

#### **ENGR 109. Technology in Modern Europe and America, 1700-Present (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the emergence of modern Europe through the first and second industrial revolutions in Europe and America. Explores the development of device commodities as the typical form of consumer technology in the nineteenth and twentieth centuries, as well as addresses philosophical issues in understanding technology. Cross-listed with HIST 109.

#### **ENGR 118. Engineering Modeling and Analysis (5)**

Lecture, 4 hours; discussion, 1 hour. Prerequisite(s): CHEM 001A or CHEM 01HA; CS 010 or 030; MATH 046; PHYS 040B; or consent of instructor. Covers the formulation of mathematical models for engineering systems. Includes applying mass, momentum, and energy balances to derive governing differential equations; solving equations with the use of spreadsheets and other software packages; and fitting linear and nonlinear models to experimental data. Credit is awarded for only one of ENGR 118 or ME 118.

#### **ENGR 170. Technology, Policy, and Ethics (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing. Provides contemporary perspectives on interplays between technology, public policy, and ethics. Covers social, legal, and ethical issues such as liability, as well as environmental, patent, and copyright law. Cross-listed with PBPL 170. **Norbeck**

#### **ENGR 171. Globalization (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): junior standing. Covers technological drivers of globalization. Includes social, economic, and political consequences. Explores the cultural aspects of globalization, including barriers and drivers for economic and cultural interdependence and integration, as well as virtual global organizations. Cross-listed with PBPL 171. **Norbeck**

#### **ENGR 180W. Technical Communications (4)**

Lecture, 3 hours; workshop, 3 hours. Prerequisite(s): a grade of "C" or better in ENGL 001B. Develops oral, written, and graphical communication skills. Involves extensive oral communication, presentations in small groups, and preparing and critiquing reports, proposals, instructions, and business correspondence. Emphasizes professional and ethical responsibilities and the need to stay current on technology and its global impact on economics, society, and the environ-

ment. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better.

**ENGR 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing or consent of instructor. To be taken with the consent of the chair of the appropriate Engineering program as a means of meeting special curricular problems. Units in this course may not be used to meet requirements for the major unless so designated as a replacement for a requirement not being offered during the student's remaining tenure. Course is repeatable to a maximum of 9 units.

**ENGR 191S. Seminar in Sacramento (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Center at Sacramento Program. Examines aspects of the Sacramento area, including cultural, political, and governmental institutions and the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Sacramento. Required of participants in the UCR Center at Sacramento Program. Cross-listed with HASS 191S and NASC 191S.

#### **ENGR 191W. Seminar in Washington, D.C. (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Washington Center Program. Examines aspects of the Washington, D.C., area, including cultural, political, and governmental institutions as well as the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Washington, D.C. Required of participants in the UCR Washington, D.C., Center Program. Cross-listed with HASS 191W and NASC 191W.

#### **ENGR 198-I. Individual Internship (1-12)**

Internship, 3-36 hours. Prerequisite(s): upper-division standing or consent of instructor; consent of off-campus supervisors and appropriate Engineering program chair. Designed to provide experience as a practicing engineer in a governmental, industrial, or research unit. Jointly supervised by an off-campus sponsor and an Engineering faculty member. Requires a written final report. Units may not be used to satisfy major requirements. Course is repeatable to a maximum of 16 units.

## English

### **Subject abbreviations: BSWT and ENGL**

### **College of Humanities, Arts, and Social Sciences**

Deborah Willis, Ph.D., Chair and Director,

English Composition

John C. Briggs, Ph.D.,

Director, Entry Level Program

Director, University Writing Program

George E. Haggerty, Ph.D.,

Director, Undergraduate Studies

Robert Latham, Ph.D.,

Director, Graduate Admissions

James Tobias, Ph.D.,

Director, Graduate Studies

Department Office, 1201 Humanities and Social Sciences; (951) 827-5301

### **Professors**

Steven G. Axelrod, Ph.D., *Distinguished Professor*

John C. Briggs, Ph.D.

Joseph W. Childers, Ph.D.

Adriana Craciun, Ph.D.

Kimberly J. Devlin, Ph.D.

John M. Ganim, Ph.D.

George E. Haggerty, Ph.D., *Distinguished Professor*

Robert Latham, Ph.D.

Stanley N. Stewart, Ph.D., *Distinguished Professor*

### **Professors Emeriti**

Rise B. Axelrod, Ph.D.

Edwin M. Eigner, Ph.D.

Robert N. Essick, Ph.D.

Carole Fabricant, Ph.D.

Ralph Hanna, III, Ph.D.

John B. Vickery, Ph.D.

### **Associate Professors**

Jennifer Doyle, Ph.D.

Heidi Brayman Hackel, Ph.D.

Keith Harris, Ph.D.

Katherine A. Kinney, Ph.D.

Vorris Nunley, Ph.D.

Michelle Hermann Raheja, Ph.D.

James Tobias, Ph.D.

Carole-Anne Tyler, Ph.D.

Deborah S. Willis, Ph.D.

Traise Yamamoto, Ph.D.

Susan Zieger, Ph.D.

### **Assistant Professors**

Andrea Denny-Brown, Ph.D.

Erica A. Edwards, Ph.D.

Weihsin Gui, Ph.D.

The English Department offers the university community a range of composition courses that develop the skill of writing effective prose, a skill essential to undergraduate work and to communication in society generally. Students can also enjoy and profit from a broad range of literature courses offered by the department, including a number of lower-division courses designed especially with the non-English major in mind.

## Major

The English major offers a well-balanced, thought-provoking program for students with a serious interest in the study of literature.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. in English are as follows:

1. English 020A, ENGL 020B, and ENGL 020C (15 units). These courses are normally required of all English majors as a prerequisite to upper-division courses.
2. ENGL 102 (4 units). This course should normally be taken prior to or concurrently with the student's first upper-division English course.
3. Four courses (16 units); one course from each of the following areas:
  - a) English Literature to 1660: ENGL 117A, ENGL 117B, ENGL 117C, ENGL 128E, ENGL 128F, ENGL 128G, ENGL 129A, ENGL 148Q, ENGL 149, ENGL 151A,

ENGL 151B, ENGL 151T, ENGL 152, ENGL 153, ENGL 154

b) English Literature 1660-1900:

ENGL 125A, ENGL 125B, ENGL 128I, ENGL 128J, ENGL 128K, ENGL 128M, ENGL 128N, ENGL 129B, ENGL 148P, ENGL 148X, ENGL 148Y, ENGL 148Z, ENGL 161A, ENGL 161B, ENGL 161T, ENGL 166A, ENGL 166B, ENGL 166T, ENGL 172A, ENGL 172B, ENGL 172T

c) American Literature to 1900: ENGL 126A,

ENGL 127A, ENGL 128O, ENGL 128Q, ENGL 130, ENGL 131, ENGL 132, ENGL 148G, ENGL 148W

d) Literature after 1900: ENGL 125C,

ENGL 126B, ENGL 127B, ENGL 128R, ENGL 128S, ENGL 128T, ENGL 128U, ENGL 128V, ENGL 129C, ENGL 133, ENGL 134, ENGL 135, ENGL 148E, ENGL 148M, ENGL 148R, ENGL 148S, ENGL 176A, ENGL 176B, ENGL 176C, ENGL 176T

4. One 4-unit course on literature and ethnicity, literature and gender, or literature and sexuality chosen from ENGL 121 (E-Z), ENGL 122 (E-Z)/LGBS 122 (E-Z), ENGL 123A, ENGL 123B, ENGL 124A, ENGL 124B, ENGL 136, ENGL 136T, ENGL 137T, ENGL 138A, ENGL 138B, ENGL 138T, ENGL 139, ENGL 139T, ENGL 143 (E-Z), ENGL 144 (E-Z)

5. One 4-unit course on literature and related fields, including theory, or a literary theme or genre chosen from ENGL 033, ENGL 100 (E-Z), ENGL 101, ENGL 104, ENGL 140 (E-Z), ENGL 141 (E-Z), ENGL 142 (E-Z), ENGL 143E/MCS 143E, ENGL 145 (E-Z), ENGL 146 (E-Z)

6. Five additional upper-division English courses (20 units). Only 4 units from ENGL 103 or any upper-division Creative Writing course will be accepted toward the fulfillment of this requirement. Four units of ENGL 190 may be counted toward this requirement. Proposals for ENGL 190 must be approved by a sponsoring faculty member and the department chair. If the student wishes to offer units from ENGL 190 as part of the 20 units, a copy of an approved petition will be placed in the student's file.

Total units in major: 63 units, of which at least 15 units and no more than 20 units must be at the lower-division level.

Students are encouraged to take at least one of the following as a college breadth requirement or as an elective: CLA 027A, CLA 027B, CLA 040; CPLT 017A, CPLT 017B, CPLT 017C; ETST 114, ETST 120, ETST 124, ETST 138, ETST 170/WRLT 170, ETST 183; or any literature course in a language other than English. Students are also encouraged to take a course in British or American history, such as HIST 017A, HIST 017B, HISE 150, HISE 151, HISE 152.

Each student is assigned a faculty advisor for help in shaping a program and following it

through to graduation. Students must see their advisors on a regular basis, normally once per quarter prior to registration. Information about advisors is available in the department office from the undergraduate academic advisor.

## English Undergraduate Honors Program

The English Department awards departmental honors to those who complete the following requirements:

1. Maintain a GPA of 3.5 or higher in the English major.
2. Complete 14 additional units of upper division courses in English.
3. Complete English 193A "Senior Seminar" (the units of which may be used toward the additional upper division unit requirement)
4. Complete English 193B "Senior Research," by submitting a Senior Paper as the result of research begun in 193A "Senior Seminar."
5. Successfully present their Senior Paper in an undergraduate Honors Research colloquium or conference sponsored by the English Department.

Students may request to participate in the honors track or they may be invited. Students must declare their intention to participate by the end of the fourth quarter prior to graduation.

### Minor

The English minor is designed to provide an overview of English and American literature, an opportunity for the exercise of disciplined literary analysis, and a varied experience of the best literature in English.

1. Lower-division requirements (14 units)
  - a) Two courses chosen from ENGL 020A, ENGL 020B, ENGL 020C
  - b) One course chosen from ENGL 012A, ENGL 012B, ENGL 012C, ENGL 012 (E-Z), ENGL 014, ENGL 015, ENGL 017, ENGL 018, ENGL 022, ENGL 033/MCS 033
2. Upper-division requirements (16 units)
  - a) Four courses of upper-division English. Only four (4) units from ENGL 103 or ENGL 190 will be accepted toward fulfillment of this requirement. Proposals for ENGL 190 must be approved by a sponsoring faculty member and the department chair. If the student wishes to offer units from ENGL 190 as part of the 16 units, a copy of the approved petition will be placed in the student's file.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## University of California Entry Level Writing Requirement

For regulations governing the University of California Entry Level Writing Requirement, see

Requirements for the Bachelor's Degree in the Undergraduate Studies section of this catalog. Students who have fulfilled the requirement may enroll in ENGL 001A. Students who are held for the requirement must take the University of California Analytical Writing Placement Exam. Results determine which course(s) a student should take to satisfy university requirements. Visit [elwr.ucr.edu](http://elwr.ucr.edu) for more information. You may also contact the University Writing Program at (951) 827-7760.

## Teaching Credential Preparation Programs

Students interested in becoming teachers at the elementary or secondary school level may combine the English major with a program of study leading to the multiple subjects (elementary) or single subject (secondary) credential preparation program. Details and counseling on the Prepare to Teach Program, a preparation program for the multiple subjects credential, are available in the Office of Interdisciplinary Programs, 3111 INTS, (951) 827-1801. Details and counseling on other programs are available in the Department of English or the Graduate School of Education.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section.

## Graduate Program

The Department of English offers the Ph.D. and M.A. degrees in English.

**Admission** All domestic and international applicants must supply GRE General Test scores (quantitative and verbal) earned within the past five years.

### Doctoral Degree

The Department of English offers the Ph.D. degree in English.

The doctoral program in English prepares students to become informed teachers and scholar-critics capable of significant original literary scholarship.

**Admission** Admission is open to qualified candidates with a B.A. or M.A. degree, preferably in English or a related field. Students with an

M.A. in another field may be required to take additional course work.

**Course Work** The candidate entering the program without an M.A. must complete (with a grade of "B" or better) a minimum of 66 units of course work. Prior to taking Qualifier I, students must meet the course work requirement of the M.A. Degree (42 units). Upon successfully passing Qualifier Examination I, students must complete at least an additional six seminars (24 units) in 200-level course work, excluding ENGL 280, ENGL 291, ENGL 292, and ENGL 299. The candidate with an M.A. from another institution must complete a minimum of 36 units of course work in 200-level courses, excluding ENGL 280, ENGL 291, ENGL 292, and ENGL 299. All students, in consultation with the graduate advisor, select primary and secondary fields of study and identify a third, more specialized area related to a dissertation topic. Once course work requirements are satisfied, all students take the Qualifier Examination II and complete a dissertation.

**Language Requirement** Students entering with a B.A. must demonstrate proficiency in two languages other than English before advancement to candidacy. Students entering with an M.A. from institutions that required proficiency in a language other than English for the master's degree must demonstrate proficiency in a second language before advancement to candidacy. In lieu of a second language, students from both groups may complete one of three alternatives involving the first language or a related field approved by the Graduate Committee. For details consult the graduate advisor or [english.ucr.edu](http://english.ucr.edu).

Students entering with an M.A. from institutions that did not require proficiency in a language other than English for the master's degree must demonstrate proficiency in one language other than English. Alternatives described above are not available to these students.

**Qualifying Examinations I and II** At the end of the sixth quarter, students who have entered the program with a B.A. become eligible to receive an M.A. upon completion of the Qualifying Examination I. For this examination, students submit a portfolio of three essays, one of which has been revised according to the terms of ENGL 296, and a 1000- to 1500-word metacommentary explaining the aims and achievements of the essays and their contributions to a coherent research agenda. The student is then examined orally for one hour on the portfolio and two distinct fields related to at least two of the three essays. Following successful completion of this examination and a review of the entire student file, the graduate committee recommends the awarding of the M.A. degree. (The Qualifying Examination I is waived for students with an M.A. from another institution.) After the completion of all course work, students take the Qualifying Examination II to be advanced to candidacy.

The Qualifying Examination II includes three written examinations, followed by an oral examination of up to three hours, and is designed to prepare the student for work on the dissertation. The oral examination includes a short presentation by

the student, which focuses on the written exam just taken and on the student's plan for the dissertation.

**Dissertation** The dissertation should be related to the individualized course of study preceding it and should draw out the best research and critical talents of the candidate.

For a more detailed description of the requirements for the Ph.D., contact the Graduate Assistant, Department of English.

**Normative Time to Degree including UCR M.A. Work** 18 quarters (or 15 quarters for students with an M.A. from another institution)

## Master's Degree

The Department of English also offers a terminal M.A. program for a small number of students who have the M.A. as their degree objective.

**Admission** Admission is open to qualified candidates with a B.A. degree in English or a closely related field of study.

**Course Work** Each student's specific program is individually structured in consultation with the graduate advisor. The candidate must complete (with a grade of "B" or better) a minimum of 42 units of course work, including ENGL 200 (Introduction to Graduate Study in English), ENGL 296 (Master's Portfolio), and at least 36 units in other 200-series courses, excluding ENGL 280, ENGL 291, ENGL 292, and ENGL 299. Eight (8) units of 100-series courses (excluding ENGL 103 and ENGL 190) may be counted toward the 42-unit requirement with the permission of the graduate advisor.

**Language Requirement** Students must demonstrate proficiency in one language other than English.

**M.A. Examination** In the sixth quarter of the program, the student completes the Qualifying Examination I as described in the Ph.D. program above. Following successful completion of this examination and a review of the entire student file, the graduate committee recommends awarding the M.A. degree. (Students in the terminal M.A. program who wish to change their degree objective to the Ph.D. must notify the graduate advisor before the end of their fifth quarter to request that consideration for the Ph.D. program be a part of the M.A. examination process. The graduate committee then reviews the results of the M.A. examination and the entire student file to determine whether the student may continue into the Ph.D. program. For details, contact the Graduate Assistant, Department of English.

**Normative Time to Degree** 6 quarters

## Basic Writing Lower-Division Courses

**BSWT 003. Basic Writing for Second-Language Students (5)** Lecture, 3 hours; workshop, 2 hours. Prerequisite(s): an appropriate score on the University of California Analytical Writing Placement Exam; concurrent enrollment in BSWT 003D or BSWT 003L. An

introductory course designed for students who need instruction in English as a second language. Helps to develop writing proficiency by means of regular written assignments and intensive individual interaction between student and instructor. Students who pass the course with a grade of "S" should enroll in ENGL 004. *Students should be formally enrolled prior to the beginning of instruction and should attend the first meeting to avoid being dropped from the class.* Graded Satisfactory (S) or No Credit (NC).

**BSWT 003D. Basic Writing for Second-Language Students (1)** Discussion, 1 hour. Prerequisite(s): concurrent enrollment in BSWT 003. Focuses on reading literature with close attention to grammar and style, organizing essays, honing syntax, and asking and answering academic questions. *Students should be formally enrolled prior to the beginning of instruction and should attend the first meeting to avoid being dropped from the class.* Graded Satisfactory (S) or No Credit (NC).

**BSWT 003L. Basic Writing for Second-Language Students (1)** Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in BSWT 003. Focuses on mastery of principles and applications of English grammar and idiomatic expression, as well as critical reading, which are pertinent to second-language students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

## English Lower-Division Courses

**ENGL 001A. Beginning Composition (4)** Lecture, 3 hours; extra writing and rewriting, 3 hours. Prerequisite(s): fulfillment of the University of California Entry Level Writing Requirement. Introduces students to the strategies of personal writing in a multicultural context. *Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class.* Credit is awarded for only one of ENGL 001A or ENGL 01PA.

**ENGL 001B. Intermediate Composition (4)** Lecture, 3 hours; extra writing and rewriting, 3 hours. Prerequisite(s): ENGL 001A with a grade of "C" or better or ENGL 01PA with a grade of "C" or better. Emphasizes the transition from personal to public writing in a multicultural context. *Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class.*

**ENGL 001C. Applied Intermediate Composition (4)** Lecture, 3 hours; extra writing and rewriting, 3 hours. Prerequisite(s): ENGL 001B with grade of "C" or better. Priority enrollment granted to students with senior standing. Addresses the function of writing in a range of contemporary situations, including that of the academy, from a critical and theoretical perspective. *Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class.* Credit is awarded for only one of ENGL 001C, ENGL 01HC, or ENGL 01SC.

**ENGL 01HC. Honors Applied Intermediate Composition (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ENGL 001B with grade of "C" or better; admission to the University Honors Program or consent of instructor. Priority enrollment granted to students with senior standing. Honors course corresponding to ENGL 001C and ENGL 01SC. A course in extended expository prose with emphasis on principles of explanation, interpretation, and argument.

Special attention is paid to the theoretical implications of various modes of academic inquiry. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ENGL 001C, ENGL 01HC, or ENGL 01SC.

**ENGL 01PA. Beginning Composition: Intensive (4)**

Lecture, 3 hours; tutorial, .5 hours; extra writing and rewriting, 3 hours. Prerequisite(s): an appropriate score on the University of California Analytical Writing Placement Exam; consent of the Director of the University Writing Program; concurrent enrollment in ENGL 005L. Introduces students to the strategies of personal writing in a multicultural context. Students who pass the course with a grade of "C" or better have completed the University of California Entry Level Writing Requirement and are eligible to enroll in ENGL 001B. *Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class.* Credit is awarded for only one of ENGL 001A or ENGL 01PA.

**ENGL 01SC. Applied Intermediate Composition for Science and Engineering Majors (4)**

Lecture, 3 hours; extra writing and rewriting, 3 hours. Prerequisite(s): ENGL 001B with grade of "C" or better. Priority enrollment granted to students with senior standing. A course for science and engineering majors corresponding to ENGL 001C and ENGL 01HC. Helps students build the writing skills most relevant to their future work in science or engineering fields. Credit is awarded for only one of ENGL 001C, ENGL 01HC, or ENGL 01SC.

**ENGL 002. English Study Group (0)** Lecture, 4 hours; activity, 4 hours. Prerequisite(s): concurrent enrollment in the Summer Bridge Program, ENGL 004, and ENGL 004D. An introduction to developing thinking and problem-solving skills. Introduces university life through exposure to test-taking techniques, effective note-taking strategies, time management, and university procedures and practices. Carries workload credit equivalent to 2 units but does not count towards graduation units. Offered in summer only. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of ENGL 002 or MATH 002.

**ENGL 004. English Writing (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): an appropriate score on the University of California Analytical Writing Placement Exam or a grade of "S" in BSWT 003; concurrent enrollment in ENGL 004D or ENGL 004L. Covers ground rules of academic inquiry and exchange in English writing. Students who pass the course with a grade of "C" or better have completed the University of California Entry Level Writing Requirement and are eligible to enroll in ENGL 001A. *Students should be formally enrolled prior to the beginning of instruction and should attend the first meeting to avoid being dropped from the class.* Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ENGL 004 or ENGL 004E.

**ENGL 004D. English Writing (1)** Discussion, 1 hour. Prerequisite(s): concurrent enrollment in ENGL 004. Focuses on critical reading of assigned texts, organizing essays, honing syntax, and asking and answering academic questions. *Students should be formally enrolled prior to the beginning of instruction and should attend the first meeting to avoid being dropped from the class.* Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of ENGL004D, ENGL004L or ENGL04DE.

**ENGL 004E. English Writing Hybrid (4) Summer**

Lecture, 6 hours; extra reading, 3 hours; activity, 3 hours; hard-copy reading journals and online discussion with peers, followed by reporting to the class, 3 hours per week (individual and group activity).

Prerequisite(s): an appropriate score on the University of California Analytical Writing Placement Exam or a grade of "S" in BSWT 003; concurrent enrollment in ENGL 04DE. Covers ground rules of academic inquiry and exchange in English writing. Fifty percent of the course will be taught online. Requires access to Adobe Flash Player and Broadband connection. Students who pass the course with a grade of "C" or better have completed the UC Entry Level Writing Requirement. Offered in summer only. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ENGL 004 or ENGL 004E.

**ENGL 04DE. English Writing Hybrid (1)** Discussion, 1.5 hours; workshop, 1.5 hours. Prerequisite(s): concurrent enrollment in ENGL 004E. Focuses on critical reading of assigned texts, organizing essays, honing syntax, and asking and answering academic questions. Offered in summer only. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of ENGL004D, ENGL004L, or ENGL04DE.

**ENGL 004L. English Writing (1)** Laboratory, 3 hours.

Prerequisite(s): concurrent enrollment in ENGL 004. Focuses on mastery of principles and applications of English grammar and idiomatic expression, as well as critical reading, for students who do not need, or have advanced beyond, second-language instruction. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units. Credit is awarded for only one of ENGL004D, ENGL004L, or ENGL04DE.

**ENGL 005. Ideas in Conflict (4)** Lecture, 3 hours; extra writing and rewriting, 5 hours. Prerequisite(s): an appropriate score on the University of California Analytical Writing Placement Exam; concurrent enrollment in ENGL 005D or ENGL 005L. Examines elements of academic argument in the context of major, conflicting texts. Particular attention is given to identifying, analyzing, and framing debatable questions and issues; finding and developing appropriate, persuasive arguments; and tapping the syntactic resources of standard English. Includes extensive readings and numerous writing assignments along with formal oral presentations. Students who pass the course with a grade of "C" or better have completed the University of California Entry Level Writing Requirement and are eligible to enroll in ENGL 001A. *Students should be formally enrolled prior to the beginning of instruction and should attend the first meeting to avoid being dropped from the class.* Satisfactory (S) or No Credit (NC) grading is not available.

**ENGL 005D. Ideas in Conflict (1)** Discussion, 1 hour. Prerequisite(s): concurrent enrollment in ENGL 005. Focuses on reading assigned texts with close attention to grammar and style, organizing essays, honing syntax, and asking and answering academic questions. *Students should be formally enrolled prior to the beginning of instruction and should attend the first meeting to avoid being dropped from the class.* Graded Satisfactory (S) or No Credit (NC).

**ENGL 005L. English Writing (1)** Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in ENGL 005. Focuses on advanced mastery of principles and applications of English grammar and idiomatic expression, as well as critical reading. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

**ENGL 006D. Qualifier Course Adjunct (1 or 2)**

Discussion, 1-2 hours. Prerequisite(s): concurrent enrollment in a qualifier course. Provides individual and group instruction in support of writing-intensive courses designated as qualifier courses. Focuses on interpreting the qualifier course's assignments; developing topics; preparing, editing, and revising drafts. Qualifier courses are offered by various departments to give eligible students an opportunity to meet the

University of California Entry Level Writing Requirement while earning baccalaureate credit. Students may obtain information about qualifier courses by contacting the Writing Resource Center. *Students should be formally enrolled prior to the beginning of instruction and should attend the first meeting to avoid being dropped from the class.* Graded Satisfactory (S) or No Credit (NC).

**ENGL 012 (E-Z). Introduction to Literature (4)** Lecture, 3 hours; assignment of the remaining hours varies from segment to segment. A study of topics, themes, or types of literature. The texts may be selected from any one, or from a combination, of several periods of English and/or American literature. Intended primarily for nonmajors.

**ENGL 012A. Introduction to Poetry (4)** Lecture, 3 hours; extra reading, 3 hours. An introductory study of poems selected from various periods, including the modern. Special attention is paid to themes, forms, and kinds. Intended primarily for non-English majors.

**ENGL 012B. Introduction to Fiction (4)** Lecture, 3 hours; extra reading, 3 hours. An introductory study of novels and short stories selected from various periods, including the modern. Special attention is paid to themes, forms, and kinds. Intended primarily for non-English majors.

**ENGL 012C. Introduction to Drama (4)** Lecture, 3 hours; extra reading, 3 hours. An introductory study of plays selected from various periods, including the modern. Special attention is paid to themes, forms, kinds, and relationships of text to theatrical performance. Intended primarily for non-English majors.

**ENGL 012D. Great American Speeches (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Involves close reading, analysis, imitation, and critique of prominent speeches from the American Revolution to the present.

**ENGL 014. Major American Writers (4)** Lecture, 3 hours; extra reading, 3 hours. Explores masterpieces of American literature. Focuses on classic and contemporary works by such writers as Hawthorne, Thoreau, Emily Dickinson, Twain, Hemingway, F. Scott Fitzgerald, Ralph Ellison, and Joyce Carol Oates. Intended primarily for nonmajors.

**ENGL 015. Modern Literature (4)** Lecture, 3 hours; extra reading, 3 hours. An introductory course designed primarily for nonmajors. Focuses on an important theme or technique in modern and contemporary literature.

**ENGL 017. Shakespeare (4)** Lecture, 3 hours; consultation/discussion, 1 hour. This course, intended primarily for non-English majors, is designed to provide an understanding of drama as a form of literary art and to encourage a familiarity with Shakespeare's most important works. Plays from each dramatic genre (comedy, history and tragedy) will be included.

**ENGL 018. Shakespeare on Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An examination of cinematic adaptations of Shakespeare's plays, paying particular attention to issues of cinematic theory, historical adaptation, and thematic reconstruction. Credit is awarded for only one of ENGL 018 or THEA 022.

**ENGL 020A. Introduction to British Literary Tradition (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 2 hours. Designed for English majors. Introduces British literature from its beginnings. Explores literary forms, genres, and periods, and introduces students to the basics of literary theory and to the literary history of Britain.

**ENGL 020B. Introduction to American Literary Tradition (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 2 hours. Designed for English majors. Introduces American literature from its beginnings, with attention to historical and cultural contexts.

**ENGL 020C. Introduction to Alternative Critical Perspectives on Literature and Culture (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 2 hours. Introduces students to work associated with alternative critical traditions, including Chicano, African, African-American, and Caribbean literature, or feminist, Marxist, and postcolonial perspectives on literature and culture.

**ENGL 021. Culture Clash: Studies in Latino Theatre and Film (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to Latino theatre and film from 1965 to the present. Examines the major works of playwrights and important films and videos. Cross-listed with THEA 021.

**ENGL 022. Writing Red: Native American Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Acquaints students with a range of Native American literatures. Discusses mass-mediated images of Native Americans and how “Indianness” is constructed, contested, and embodied in poetry, film, autobiography, fiction, and photography.

**ENGL 023. African American Autobiography (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): fulfillment of the University of California Entry Level Writing Requirement. An introduction to African American literature, focusing on how black literature in the United States has been shaped by self-narrated responses to terror and oppression. Examines autobiographies by Frederick Douglass, Harriet Jacobs, Langston Hughes, Ida Wells-Barnett, and Malcolm X.

**ENGL 033. Introduction to Comparative Media Studies (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the study of two or more media, such as film and television or digital media. Explores various critical approaches to the media (e.g., formalism, feminism, Marxism). Focuses on the media of rhetoric, media similarities and differences, and cross-media borrowing.

## Upper-Division Courses

**ENGL 100 (E-Z). Scriptures, Myths, and Interpretation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Focuses on issues of scriptural and mythical analysis. Explores the impact of scripture and myth on literature written in English; textual development of the Hebrew scripture including the development of the King James version; major authors’ uses of scripture and myth; exegesis; scripture and myth in current criticism and theory.

**ENGL 101. Critical Theory (4)** Lecture, 3 hours; consultation, 1 hour. A study of major theoretical issues in representative critical and scholarly works.

**ENGL 102. Introduction to Critical Methods (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a major in English or consent of instructor. An in-depth analysis of the formal features of several genres, as well as an introduction to theoretical and critical approaches. Credit is awarded for only one of ENGL 102 or ENGL 102W.

**ENGL 102W. Introduction to Critical Methods (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a major in English; ENGL 001B with a grade of “C” or better; two of the following courses: ENGL 020A, ENGL 020B, ENGL 020C. An in-depth analysis of the formal features of several genres, as well as an introduction to theoretical and critical approaches. Fulfills the third-quarter writing requirement. Credit is awarded for only one of ENGL 102 or ENGL 102W.

**ENGL 103. Advanced Composition (4)** Lecture, 3 hours; discussion/consultation, 1 hour. Prerequisite(s): ENGL 001C or the equivalent. Principles of expository prose, with intensive practice. Advanced course in composition, not remedial. May be repeated for credit up to a maximum of 12 units.

**ENGL 104. Film and Media Theory (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers different types of film and media theory. Addresses formalist, psychoanalytic, Marxist, feminist, and other approaches to the cinema and/or other media. Cross-listed with MCS 104.

**ENGL 112. History of the English Language (4)** Lecture, 3 hours; consultation/discussion, 1 hour. An introductory survey of the history of English, including its Indo-European ancestry, its vocabulary and etymologies, changes in pronunciation, spelling, and grammar, development of dictionaries, and changing attitudes toward the language and usage.

**ENGL 117A. Shakespeare: History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A close analytical study of plays selected from one of Shakespeare’s dramatic genres as they are designated in the First Folio.

**ENGL 117B. Shakespeare: Comedy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A close analytical study of plays selected from one of Shakespeare’s dramatic genres as they are designated in the First Folio.

**ENGL 117C. Shakespeare: Tragedy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A close analytical study of plays selected from one of Shakespeare’s dramatic genres as they are designated in the First Folio.

**ENGL 117T. Topics in Shakespeare (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A focused study of works by Shakespeare selected from different genres.

**ENGL 120A. Native American Literature to 1900 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical study of Native American literature from the era of oral narrative to 1900, with special attention to autobiography and fiction, as well as criticism and theory.

**ENGL 120B. Native American Literature after 1900 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical study of Native American literature from 1900 to the present, with special attention to poetry, visual culture, fiction, and self-life-narration, as well as criticism and theory.

**ENGL 120T. Studies in Native American Literature (4)** Lecture, 3 hours; extra reading, 3 hours.

Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A focused study of a topic, genre, period, or author in Native American literature. Examples might include visual culture, oral narrative, collaborative autobiography, ethnography, or poetry.

**ENGL 121 (E-Z). Postcolonial Literatures of Asia, Africa, and the Caribbean (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. The analysis of colonial discourse and of the postcolonial condition. The following topics, among others, may be addressed: historiography and subalternity; nationalism, gender, and sexuality; neocolonialism and transnationality; theorizing resistance; postcolonial identity politics and the discourses of tradition and modernity; the postcolonial intellectual; and postcolonial filmmaking and Third Cinema.

**ENGL 122 (E-Z). Literature and Sexualities (4)** Lecture, 3 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of English and American literature from the perspective of sexuality and sexual identity. Courses cover issues such as gay and lesbian texts and contexts; sexual ideologies and literature; marginalized writers and texts; and the uses of theories of sexualities in the study of literature. Cross-listed with LGBS 122 (E-Z).

**ENGL 123A. Women and Literature: Poetry (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of writing by women from the medieval period to the present, examining the effects of race and class as well as gender on literary form and language, and considering questions of literary influence and transmission.

**ENGL 123B. Women and Literature: Autobiography (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of writing by women from the medieval period to the present, examining the effects of race and class as well as gender on literary form and language, and considering questions of literary influence and transmission.

**ENGL 124A. Female Novelistic Traditions: Eighteenth and Nineteenth Centuries (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of the works of women novelists, writing at different historical moments and in different cultural milieus. Attention is given to the psychological, political, and technical features of the tradition; the connections and contrasts within it; and the problematics of female literary influence.

**ENGL 124B. Female Novelistic Traditions: Twentieth Century (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of the works of women novelists, writing at different historical moments and in different cultural milieus. Attention is given to the psychological, political, and technical features of the tradition; the connections and contrasts within it; and the problematics of female literary influence.

**ENGL 125A. The Development of the English Novel: Eighteenth Century (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of British fiction,

with some attention to the criticism and theory of the novel.

**ENGL 125B. The Development of the English Novel: Nineteenth Century (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of British fiction, with some attention to the criticism and theory of the novel.

**ENGL 125C. The Development of the English Novel: Twentieth Century (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of British fiction, with some attention to the criticism and theory of the novel.

**ENGL 126A. The American Novel: Nineteenth Century (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of American long fiction in the nineteenth century, with special attention to such modes as romance, realism, and naturalism.

**ENGL 126B. The American Novel: Since 1900 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of American long fiction since 1900, with special attention to such modes as realism, modernism, and postmodernism.

**ENGL 127A. American Poetry: Before 1900 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical study of American poetry, focusing on the evolutionary and revolutionary aspects of its forms and themes.

**ENGL 127B. American Poetry: Twentieth Century (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical study of American poetry, focusing on the evolutionary and revolutionary aspects of its forms and themes.

**ENGL 127T. Studies in American Poetry (4)** Lecture, 3 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A focused study of a topic, motif, genre, period, or movement in American poetry. Examples might include political or regional poetry, the epic or lyric, or Beat poetry or Language poetry.

**ENGL 128 (E-Z). Major Authors (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive study of a major English or American author. E. Chaucer; F. Spenser; G. Milton; I. Swift; J. Austen; K. Wordsworth; M. Dickens; N. George Eliot; O. Melville; Q. Dickinson; R. Woolf; S. Joyce; T. Faulkner; U. Baldwin; V. Salman Rushdie; W. Maya Angelou; X. Toni Morrison.

**ENGL 129A. English and American Drama: Elizabethan and Jacobean Drama (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of British and American drama. Each segment may be taken independently of the others.

**ENGL 129B. English and American Drama: Restoration and Eighteenth-Century Drama (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of British and American drama. Each segment may be taken independently of the others.

**ENGL 129C. English and American Drama: Modern British and American Drama (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division

standing or consent of instructor. A critical study of British and American drama. Each segment may be taken independently of the others.

**ENGL 130. American Literature, 1620-1830 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Examination of writing in America of the pre-colonial, colonial, and early national periods, including the work of such writers as Anne Bradstreet, Benjamin Franklin, Susanna Rowson, and Washington Irving.

**ENGL 131. American Literature, 1830 to the Civil War (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of innovation and conflict in the American Renaissance, as represented in such writers as Emerson, Hawthorne, Poe, Melville, Stowe, Thoreau, Douglass, and Whitman.

**ENGL 132. American Literature from the Civil War to 1914 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. New departures in the American literary consciousness as registered in the works of such writers as Emily Dickinson, Mark Twain, Charles W. Chesnut, Kate Chopin, Henry James, Henry Adams, and Edith Wharton.

**ENGL 133. American Literature, 1914-1945 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Modern perspectives and literary innovations in the work of such writers as William Faulkner, F. Scott Fitzgerald, Zora Neale Hurston, Wallace Stevens, William Carlos Williams, Gertrude Stein, and Eugene O'Neill.

**ENGL 134. American Literature, 1945 to the Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of postmodern, contemporary, and multicultural texts by such writers as Toni Morrison, Thomas Pynchon, Maxine Hong Kingston, Robert Lowell, Sylvia Plath, John Ashbery, and Leslie Marmon Silko.

**ENGL 135. Modern Irish Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of modern Irish literature, set against the background of the political and religious conflicts of Irish history.

**ENGL 136. Latina and Latino Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical survey of U.S. Latina/o literature, with particular attention to aesthetic achievements, recurrent forms and themes, and interrelations with other American literatures.

**ENGL 136T. Studies in Latina and Latino Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A focused study of ideas, forms, or movements in Latina/o literature such as autobiography, growing-up narratives, popular discourses (teatro, the corrido, social movement poets), and the mainstream Latina/o literary "booms."

**ENGL 137T. Studies in Comparative Minority Discourses (4)** Lecture, 3 hours; extra reading, 3

hours. Prerequisite(s): upper-division standing or consent of instructor. A focused study of ideas, forms, or movements within the field of minority discourse that emphasizes comparative readings. Possible topics include African American and Latino prison narratives, Asian American and Latino immigrant writing, movement literature of the 1960s and 1970s, independent publishing, "growing-up" narratives, and issues of identity, culture, and aesthetics.

**ENGL 138A. African American Literature through the Harlem Renaissance (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical survey of African American literature with particular attention to the development of an African American literary tradition and the challenge posed to the traditional canon of American literature.

**ENGL 138B. African American Literature since the Harlem Renaissance (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical survey of African American literature with particular attention to the development of an African American literary tradition and the challenge posed to the traditional canon of American literature.

**ENGL 138T. Studies in African American Literature (4)** Lecture, 3 hours; extra reading, 3 hours.

Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A focused study of ideas, forms, or movements in African American literature such as autobiography, conjure, the blues tradition, the Black Aesthetic, and literary vernacular.

**ENGL 139. Asian American Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical survey of Asian American literature, with particular attention to aesthetic achievements, recurrent forms and themes, and interrelations with other American literatures.

**ENGL 139T. Studies in Asian American Literature (4)** Lecture, 3 hours; extra reading, 3 hours.

Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A focused study of a genre, motif, or topic in Asian American literature such as poetry, autobiography, women's writing, nationalism, mobility narratives, gender, and sexuality.

**ENGL 140 (E-Z). Studies in Literary Genres (4)** Lecture, 3 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Practical and theoretical study of such literary genres as the lyric, the epic, the romance, tragedy, comedy, and satire.

**ENGL 141 (E-Z). Literature and Related Fields (4)** Lecture, 3 hours; extra reading, 3 hours.

Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical survey of the study of literature in relation to other areas: creativity, myth, iconography, society, science, behavior, and translation.

**ENGL 142 (E-Z). Cultural Studies (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. The formal, historical, and theoretical analysis of culture in its broadest sense, including popular literature, the mass

media, and/or the interplay between “low” and “high” or peasant and elite cultural forms. Topics may be drawn from any historical field.

**ENGL 143 (E-Z). Gender, Sexuality, and Visual**

**Cultures (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of gender and sexuality in film, television, and visual culture. E. Feminist Film Theory and Practice; F. Film and Gender; G. Screening the Lesbian; K. Queers that Kill. Cross-listed with LGBS 143 (E-Z) and MCS 143 (E-Z).

**ENGL 144 (E-Z). Race, Ethnicity, and Visual Culture (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of race and ethnicity in film, television, and visual culture. Weekly screenings and readings. I. Racial Difference and Visual Culture in the Postcolonial World Context; J. Film, Race, and Ideology: The Case of the Vietnam War; K. Decolonizing the Screen. Cross-listed with MCS 144 (E-Z).

**ENGL 145 (E-Z). Special Topics in Film and Visual**

**Culture (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An intensive formal, historical, and theoretical analysis of a theme or issue in film, media, television, and visual culture. E. Hollywood in the 1960s; F. Television and American Culture; G. Film as Writing and Writing as Film; I. Liberal Hollywood and Social “Problems”; J. The Horror Film; K. African American Visual Culture; M. The Male Nude in Photography and Film. Cross-listed with MCS 145 (E-Z).

**ENGL 146 (E-Z). Special Topics in Technoculture and**

**Digital Media (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Advanced study of theories and practices of reader and audience interaction with technologies of cultural production in general and digital media in particular. Includes praxis-oriented composition or research. E. Identities and Interactions; F. Cultures and Technologies of the Visual; G. Cultures and Technologies of the Aural; I. Advanced Composition and Rhetoric for Digital Media Authors. Cross-listed with MCS 146 (E-Z).

**ENGL 147 (E-Z). Studies in a Major Work (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Concentrated study of a single major work from the English or American literary tradition, affording an opportunity for thorough explication of the work, exploration of historical backgrounds, and relevant critical approaches.

**ENGL 148 (E-Z). Studies in Major Authors (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or at least one lower-division English course (other than composition) or consent of instructor. Intensive study of a major author not covered under ENGL 128 (E-Z). Some segments of this course may consider two authors with related concerns.

**ENGL 149. Old English Literature (4)**

Lecture, 3 hours; outside reading, 3 hours. English literature of the Anglo-Saxon period: such works as *Beowulf*, “The Seafarer,” and “The Wanderer.”

**ENGL 151A. Middle English Literature: 1066-1500 (4)**

Lecture, 3 hours; outside reading, 3 hours. An introduction to major literary genres—romance, dream vision, lyric, devotional prose, and drama.

**ENGL 151B. Middle English Literature: Later Fourteenth Century (4)**

Lecture, 3 hours; outside reading, 3 hours. Covers the great works of the later fourteenth century—Chaucer’s *Troilus*, *Piers Plowman*, and the poems of the *Gawain* poet.

**ENGL 151T. Studies in Medieval Literature (4)**

Lecture, 3 hours; consultation or discussion, 1 hour. English literature of the Middle Ages, with attention (where pertinent) to its continental backgrounds (the latter read in translation). Detailed examination of major literary works chosen to illuminate such topics as Christian theology, monasticism, chivalry, and courtly love.

**ENGL 152. Renaissance Revolutions (4)**

Lecture, 3 hours; outside reading, 3 hours. Studies in some of the major ideas and movements of the English Renaissance (1500-1600), such as Christian humanism, neo-Platonism, syncretism, puritanism, rational theology, science, republicanism, centering on such figures as More, Elyot, Castiglione, Ascham, Sidney, Jonson, Bacon, Hobbes, and Milton.

**ENGL 153. Studies in Early Renaissance Literature (4)**

Lecture, 3 hours; extra reading, 3 hours. Studies in some of the major literary works of the period (excluding *The Faerie Queene*). Topics may center on comparisons with other art forms, on genres like the lyric, the pastoral, the romance, etc., or on ideas or topics of importance as they are reflected in the literary forms of the period.

**ENGL 154. Studies in Late Renaissance Literature (4)**

Lecture, 3 hours; extra reading, 3 hours. Studies of some of the major literary figures of the period (excluding Milton). Topics may center on major late English renaissance ideas or themes such as the political, philosophical, or religious questions, or on other ideas or topics of importance, as they are reflected in the literary forms of the period (metaphysical or Cavalier poetry, the character, etc.).

**ENGL 161A. Restoration and Eighteenth-Century English**

**Literature: 1600-1730 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Emphasizes drama (Wycherley, Congreve, Behn, etc.) and satire (Dryden, Rochester, Pope, Gay, Swift).

**ENGL 161B. Restoration and Eighteenth-Century English**

**Literature: 1730-1790 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Emphasizes the emerging English novel (Defoe, Richardson, Fielding, Smollett, Sterne, Burney), mid-century poetry (Thomson, Gray, Goldsmith), and the Age of Johnson (including Boswell, Wollstonecraft, Burke).

**ENGL 161T. Studies in Eighteenth-Century Literature (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of the relation of Restoration and eighteenth-century literature to its social and intellectual contexts: the rise of the bourgeoisie, the growth of British imperialism, the Industrial Revolution, the triumph of Newtonian science, philosophical empiricism, classicism, primitivism, antiquarianism, etc.

**ENGL 166A. Literature of the Romantic Period (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Covers writers such as Barbauld, Blake, Coleridge, Helen Williams, Wollstonecraft, and Wordsworth.

**ENGL 166B. Literature of the Romantic Period (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Covers writers such as Byron, Hazlitt, Keats, Scott, Mary Shelley, and Percy Shelley.

**ENGL 166T. Studies in English Romanticism (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of the relationship between the literature of the period and intellectual interests such as antiquarianism, primitivism, perfectibility, transcendentalism, and organicism.

**ENGL 172A. Literature of the Early Victorian Period (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Covers Tennyson, Browning, Carlyle, Mill, and Newman.

**ENGL 172B. Literature of the Late Victorian Period (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Covers Arnold, Ruskin, Swinburne, Pater, and Hopkins; the Pre-Raphaelites, the Aesthetic Movement, and Decadence.

**ENGL 172T. Studies in Victorian Literature (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of such ideas and movements as Romanticism, Utilitarianism, the Search for Standards, Evolution, Aestheticism, the New Naturalism, and Utopian theories, organized by areas or themes, as these ideas are reflected in the literature of the age.

**ENGL 176A. Twentieth-Century British and American**

**Literature: 1900 to Late 1920s (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Study of representative literary works: fiction, non-fiction, poetry, and drama.

**ENGL 176B. Twentieth-Century British and American**

**Literature: 1920s to 1950 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Study of representative literary works: fiction, non-fiction, poetry, and drama.

**ENGL 176C. Twentieth-Century British and American**

**Literature: 1950 to Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Study of representative literary works: fiction, non-fiction, poetry, and drama.

**ENGL 176T. Studies in Twentieth-Century British and**

**American Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. An examination of significant twentieth-century authors and texts in their aesthetic, intellectual, political, and cultural contexts.

**ENGL 179A. History of Science Fiction (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A historical survey of science fiction literature from the nineteenth century to the present. Covers major works

by H.G. Wells, Arthur C. Clarke, Stanislaw Lem, Ursula K. Le Guin, and William Gibson.

**ENGL 179B. History of Fantasy and Horror Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A historical survey of fantasy and horror literature from the nineteenth century to the present. Covers major works by Bram Stoker, H.P. Lovecraft, J.R.R. Tolkien, and Angela Carter.

**ENGL 179T. Studies in Science Fiction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Focuses on a specific theme, subgenre, period, movement, or major author within the field of science fiction. Explores topics such as science fiction and social identities, cyberpunk, and H.G. Wells and the scientific romance.

**ENGL 190. Special Studies (1-5)** To be taken with the consent of the Chair of the department as a means of meeting special curricular problems.

**ENGL 193A. Senior Seminar (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): senior standing or consent of instructor. Advanced undergraduate study of a specific topic proposed by instructor.

**ENGL 193B. Senior Seminar (2)** Seminar, 1 hour; outside research, 2 hours; term paper, 2 hours. Prerequisite(s): ENGL 193A; senior standing with a major in English. Advanced research and revision methods of continuing and expanding research begun in ENGL 193A.

## Graduate Courses

**ENGL 200. Introduction to Graduate Study in English (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A team-taught introduction to a range of critical and theoretical issues of concern to entering graduate students, including canon formation, field organization, critical and theoretical assumptions behind the establishment of various fields, and the uses of theory.

**ENGL 246. Seminar in Digital Media and Technocultural Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the history, theories, and practices of technoculture. Includes studies of computational or combinatorial texts and media. Brings together issues and contexts related to technological innovation, including the industrial production, refraction in aesthetic practices or popular cultural texts and sociopolitical deployment. Course is repeatable as content changes.

**ENGL 260. Seminar in Medieval Literature (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research in medieval literature. May focus on major authors, including Chaucer, Langland, or the *Gawain* poet; genres, including romance, prose, or the drama; thematic topics, including gender, literacy, or subjectivity; or methodology, including textual study, historicism, or literary theory. Course is repeatable as content changes.

**ENGL 262. Seminar in Renaissance Literature (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies in Renaissance literature and its literary, cultural, or historical contexts. Intensive readings in a major author, historical subperiod, or special topic. Includes critical and theoretical approaches

important to the field. Course is repeatable as content changes.

**ENGL 264. Seminar in Restoration and Eighteenth-Century Literature (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research in particular areas of Restoration and eighteenth-century literature and society such as the "rise" of the novel; women writers and readers; interactions of "high" and "low" cultures; ideologies of gender and sexuality; capitalism, colonialism, and literature; autobiographical and historical representations of self and others. Course is repeatable as content changes.

**ENGL 265. Seminar in Romantic Literature (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Research in late eighteenth- and early nineteenth-century literature and its legacy in modern critical configurations of romanticism. Course is repeatable as content changes.

**ENGL 267. Seminar in Victorian Literature (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Concentrated research and discussion of topics, issues, and figures in Victorian literature and culture. Rubrics may include, but are not limited to, theoretical approaches to Victorian studies; questions of race, class, gender, and sexuality in Victorian culture; problems of aesthetics and genre; the politics of Empire; as well as author or text focused offerings. Course is repeatable as content changes.

**ENGL 268. Seminar in British Literature since 1900 (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive analysis of figures, genres, movements, and issues in twentieth-century British literature and culture. May include topics such as Bloomsbury and the Politics of art; Joyce and Empire; Modernism, Modernity, and Gay Identities; British Postmodernism; Virginia Woolf and Feminist Theory. Course is repeatable as content changes.

**ENGL 269. Seminar in American Literature to 1900 (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research in American literature and culture to 1900. Topics may include nineteenth-century novel; slavery and narrative; gender and colonial literary culture; Whitman and Dickinson; or other historical, gender-centered or theoretical issues. Course is repeatable as content changes.

**ENGL 270. Seminar in American Literature since 1900 (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Study of representative literary texts and of current theories about the field. May focus on such topics as Modernism, Postmodernism, regionalism, alternative canons, interrelations among texts, and connections between texts and cultures. Course is repeatable as content changes.

**ENGL 272. Seminar in Critical Theory (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies in theoretical movements. May emphasize historical or thematic relations among various theoreticians. Course is repeatable as content changes.

**ENGL 273. Seminar in Cultural Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal, historical, and theoretical research into the history and theory of culture in its broadest sense: popular literature, the mass media, and the interplay between peasant and elite or "low" and "high" cultural forms. Course is repeatable as content changes.

**ENGL 274. Seminar in Feminist Discourses (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on theories and histories of gender and sexuality and analyzes the effects, in literary and other discourses, of foregrounding these categories. May involve special emphasis on "women" as writers and theorists and/or on feminist issues. Course is repeatable as content changes.

**ENGL 275. Seminar in Film and Visual Cultures (4)** Seminar, 3 hours; screening, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analysis of film, television, and other forms of visually-oriented textuality. Approaches may include cultural criticism; media theory; structural and poststructural analysis; feminist, gender, gay and lesbian theory; semiotics. Course is repeatable as content changes.

**ENGL 276. Seminar in Colonialism and Postcoloniality (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the analysis of colonial discourse and the postcolonial condition. Issues addressed include, among others, historiography and subalternity; nationalism, gender, and sexuality; neo-colonialism and transnationality; theorizing resistance; mimicry in colonial discourse; the academy, pedagogy, and the postcolonial intellectual. Course is repeatable as content changes.

**ENGL 277. Seminar in Sexualities and Genders (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines representations in a variety of literary, media, and critical genres by or of lesbians, gay men, transgenders, and others marginalized because of their sexuality or gender expression. Topics may include the history of sexuality, camp, posthuman genders and sexualities, queer theory, and lesbian and gay literature and film. Course is repeatable as content changes.

**ENGL 278. Seminar in Minority Discourse (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive study and research in cultural traditions formerly excluded from literary history, such as African American, Asian American, Chicano, and Native American. Cross-cultural studies in the representations of such marginalized groups. Topics may include the African American novel; border culture; nineteenth-century Black bodies; oral history and literature. Course is repeatable as content changes.

**ENGL 279. Seminar in Rhetorical Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research and study in rhetoric or composition theory. Topics may include the rhetorical dimensions of literature, literary theory, and civic discourse; the ethics or history of rhetoric; competing conceptions of the writing process; and the relations between rhetorical, literary, and cultural criticisms. Course is repeatable as content changes.

**ENGL 280. Colloquium in English and American Literature (2)** Seminar, 2 hours. Prerequisite(s): graduate standing. Colloquia of both a formal and informal order on current research topics for students, faculty, and visiting scholars. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**ENGL 281. Seminar in Comparative Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive study of two or more ostensibly distinct fields, periods, disciplines, or arts. Course is repeatable as content changes.

**ENGL 282. Seminar in Bibliography and Textual Criticism (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced research in the history of the book and textual production, including such topics as analytical bibliography, editorial theory and practice, and the economics of textual dissemination. Course is repeatable as content changes.

**ENGL 289. Seminar in Genres (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines individual literary genres (poetry, the novel, drama, etc.) and subgenres (epic, romance, lyric, comedy, etc.) in terms of current or historical genre theories. Course is repeatable as content changes.

**ENGL 290. Directed Studies (1-4)** Consultation, 1-3 hours; individual study, 12 hours. Prerequisite(s): consent of instructor and graduate advisor. Advanced research study culminating in written work. Course is repeatable.

**ENGL 291. Individual Study in Coordinated Areas (1-12)** outside research, variable. A program of study designed to advise and assist candidates who are preparing for examinations. Repeatable under the following rules: (1) a student may take up to 12 units prior to the award of the M.A.; (2) a student may take up to 24 additional units after award of the M.A. but prior to successful completion of the Ph.D. qualifying examination. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**ENGL 292. Concurrent Analytical Studies (1-4)** Prerequisite(s): instructor approval, or approval of instructor in the field under whom the work will be carried out. Each 292 course will be taken concurrently with some 100 series course but on an individual basis. It will be devoted to research, criticism, and written work of a graduate order commensurate in amount with the number of units elected. ENGL 101 and ENGL 103 may not be used for this arrangement. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**ENGL 296. Master's Portfolio (2)** Outside research, 6 hours; consultation, 2-3 hours. Prerequisite(s): completion of five quarters of master's study in English; consent of the Graduate Advisor. Students revise, extend, and develop essays written during their master's program in preparation for the master's portfolio examination. Graded Satisfactory (S) or No Credit (NC).

**ENGL 299. Research for Thesis or Dissertation (1-12)** Thesis, 3-36 hours. Prerequisite(s): satisfactory completion of the Ph.D. qualifying examination; consent of instructor. Research, under the direction of a faculty member, for preparation of the thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable; students may enroll in a maximum of 12 units per quarter.

## Professional Courses

**ENGL 301. Introduction to the Teaching of English (1)** individual and group conferences, 1 hour. Prerequisite(s): graduate standing. A flexible program of meetings and workshops specifically devoted to orienting apprentices and transfer TAs to the writing program at UC Riverside. Concentrates on the problem of organizing and teaching ENGL 001A, ENGL 001B, and ENGL 001C or its equivalent. Required of all apprentices and transfer TAs. Students must enroll concurrently in ENGL 302. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit for a maximum of 2 units.

**ENGL 302. Teaching Practicum (1-4)** Seminar, 1-4 hours. Prerequisite(s): graduate standing. A flexible program of meetings and conferences on the problems and techniques of writing instruction most pertinent to Basic Writing or to ENGL 001. Required of all TAs for at least five quarters, after which the TA may, with the permission of the Director of ENGL 001, elect to take ENGL 304 instead. Open to all graduate students. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**ENGL 303. Advanced Teaching Practicum (1-2)** Discussion, 1 hour; practicum, 1-2 hours. Prerequisite(s): graduate standing or consent of instructor. A flexible program of meetings and conferences on the problems and techniques of teaching literature, cultural studies, film studies, and related courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes.

**ENGL 304. Professional Research Preparations (4)** Seminar, 3 hours; outside research, 3 hours; consultation, 5 hours per quarter. Prerequisite(s): consent of instructor. Covers the procedures, preparation, and presentation of oral and written research materials, including prospectus, with individual direction from instructor. Graded Satisfactory (S) or No Credit (NC).

**ENGL 380. The Teaching of Written Composition (4)** Summer Seminar, 8 hours. Prerequisite(s): consent of instructor; participation in the Inland Area Writing Project Summer Workshop. A study of research and practice in the teaching of written composition in the elementary and secondary schools. Offered in summer only. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required.

**ENGL 381. Preparing to Teach Teachers (1-4)** Summer Seminar, 2-8 hours. Prerequisite(s): consent of instructor; concurrent enrollment in ENGL 380. Participation in the Inland Area Writing Project Summer Workshop. Preparation and presentation of inquiry projects. Emphasis on inquiry into pedagogical assumptions and the way they contribute to expert teaching practices. Offered in summer only. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required.

## Entomology

**Subject abbreviation: ENTM**  
**College of Natural and Agricultural Sciences**

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William E. Walton, Ph.D., Vice Chair  
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### Professors

Michael E. Adams, Ph.D. (Entomology/Cell Biology and Neuroscience)  
Peter W. Atkinson, Ph.D.  
Ring T. Cardé, Ph.D. *Alfred M. Boyce Chair in Entomology*  
Brian A. Federici, Ph.D.  
J. Daniel Hare, Ph.D.  
John M. Heraty, Ph.D.

Robert F. Luck, Ph.D.  
Jocelyn G. Millar, Ph.D.  
Thomas A. Miller, Ph.D.  
Joseph G. Morse, Ph.D.  
Bradley A. Mullens, Ph.D.  
Timothy D. Paine, Ph.D.  
Thomas M. Perring, Ph.D.  
Alexander Raikhel, Ph.D.  
Richard A. Redak, Ph.D.  
Michael K. Rust, Ph.D.  
Richard Stouthamer, Ph.D.  
S. Nelson Thompson, Ph.D.  
John T. Trumble, Ph.D.  
P. Kirk Visscher, Ph.D.  
Gregory P. Walker, Ph.D.  
William E. Walton, Ph.D.

### Professors Emeriti

Nancy E. Beckage, Ph.D. (Entomology/Cell Biology and Neuroscience)  
Thomas S. Bellows, Jr., Ph.D.  
Leland R. Brown, Ph.D.  
Richard D. Goeden, Ph.D.  
E. Fred Legner, Ph.D.  
James A. McMurtry, Ph.D.  
Mir S. Mulla, Ph.D.  
Earl R. Oatman, Ph.D.  
John D. Pinto, Ph.D.

### Associate Professors

Weirauch, Christiane, Ph.D.  
Alec Gerry, Ph.D.

### Assistant Professors

Dong-Hwan Choe, Ph.D.  
Anupama Dahanukar, Ph.D.  
Joao Pedra, Ph.D.  
Anandasankar Ray, Ph.D.  
Bradley White, Ph.D.

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### Lecturers

Elizabeth Grafton-Cardwell, Ph.D.  
*Pest Management*  
Matthew Daugherty, Ph.D., *Integrative Biology*  
Alec Gerry, Ph.D.  
Mark Hoddle, Ph.D. *Biological Control*  
Marshall W. Johnson, Ph.D. *Pest Management*  
Robert Krieger, Ph.D. *Toxicology*

### Cooperating Faculty

Linda Walling, Ph.D., *Genetics*

## Major

The Department of Entomology offers undergraduate programs leading to either the B.S. or the B.A. degree. The B.S. degree offers students with a strong interest in the natural sciences an opportunity to emphasize this aspect of their education. The B.A. degree is available to students who wish to obtain a broader background in the humanities and social sciences than is required of students in the B.S. program.

Information on the programs and course requirements is available at CNAS Academic Advising Center, 1223 Pierce Hall. Counseling, course recommendations, and information on education and career goals are provided by the Undergraduate Faculty Advisor, Dr. Christiane Weirauch, 125 Entomology.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

## Major Requirements

The major requirements for both the B.A. and the B.S. degrees in Entomology are as follows:

- Lower-division requirements (50–51 units)
  - BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC
  - MATH 008B or MATH 009A, MATH 009B
  - CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
- Upper-division requirements (67 units)
  - ENTM 100/BIOL 100, ENTM 107, ENTM 173/BIOL 173, and 4 units in any combination of ENTM 190, ENTM 197, ENTM 199, or ENTM 199H
  - Twenty-four (24) additional units of entomology electives, which may include up to 2 additional units of ENTM 190, ENTM 197, ENTM 199 or ENTM 199H
  - BCH 100
  - BIOL 102
  - BIOL 107A
  - CHEM 112A, CHEM 112B, CHEM 112C
  - STAT 100A

BIOL 151 and BIOL 175 are suggested in order to acquire a background in the life sciences appropriate for an Entomology major.

For students intending to specialize at the graduate level in insect toxicology or insect physiology, biochemistry, and molecular biology, it is recommended that the BCH 110A, BCH 110B, and BCH 110C sequence and BCH 102 be substituted in place of an equal number of upper-division course units in life sciences. Due to course content overlap, credit is not awarded for BCH 110A, BCH 110B, or BCH 110C if it has already been awarded for BCH 100.

### Sample Program

Freshman Year	Fall	Winter	Spring
BIOL 005A, BIOL 05LA; BIOL 005B		4	4
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC	4,1	4,1	4,1
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4
MATH 008B or MATH 009A, MATH 009B	4	4	
Humanities/Social Sciences	4		4
Total Units	17	17	17

Sophomore Year	Fall	Winter	Spring
BIOL 005C	4		
Biology/Entomology Electives CHEM 112A, CHEM 112B, CHEM 112C	4	4	4
PHYS 002A, PHYS 002B, PHYS 002C	4	4	4
PHYS 02LA, PHYS 02LB, PHYS 02LC	1	1	1
Humanities/Social Sciences, STAT 100A	4	4	5
Total Units	17	17	14
Junior Year	Fall	Winter	Spring
BIOL 102	4		
BIOL 107A, ENTM 173/ BIOL 173	4		4
ENTM 100/BIOL 100	4		
ENTM 107		4	
Biology/Entomology Electives BCH 100, ENTM 19X	4	2	8
Humanities/Social Sciences		4	4
Total Units	16	17	16
Senior Year	Fall	Winter	Spring
ENTM 19X	2		
Biology/Entomology Electives	8	8	8
Humanities/Social Sciences	4	8	4
Total Units	14	16	12

## Minor

The Department of Entomology offers a minor in Entomology designed to allow the student the freedom to pursue areas of particular interest.

The minor consists of no less than 20 and no more than 28 units of Entomology courses to be selected as follows:

- ENTM 100/BIOL 100
- Select from the following upper-division Entomology courses to complete unit requirement: ENTM 106, ENTM 107, ENTM 109, ENTM 112/BIOL 112/, BPSC 112, ENTM 114, ENTM 124, ENTM 126, ENTM 126L, ENTM 127/BIOL 127, ENTM 128, ENTM 129, ENTM 129L, ENTM 133, ENTM 162/BIOL 162, ENTM 173/BIOL 173, ENTM 190, ENTM 197, ENTM 199, ENTM 199H
- No more than 4 units of ENTM 190, ENTM 197, ENTM 199, or ENTM 199H, either solely or in combination, may be applied toward the unit requirement.
- Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Graduate Program

The Department of Entomology offers programs leading to the M.S. (thesis plan) and Ph.D. degrees with specialization in, but not restricted to, the following areas of study:

- Arthropod vectors of plant pathogens
- Behavior
- Biochemistry and physiology
- Biological control

- Chemical ecology
- Ecology and evolution
- Integrated pest management
- Insect–plant interactions
- Medical and veterinary entomology
- Molecular entomology
- Nematology
- Neuroscience
- Pathology
- Pesticide toxicology
- Systematics
- Urban entomology

Information on participating faculty and their research specializations may be found at [insects.ucr.edu](http://insects.ucr.edu). University requirements for the M.S. and Ph.D. degrees are given in the Graduate Studies section of this catalog.

**Teaching Requirement** Ph.D. students must fulfill a two-quarter teaching requirement.

**Admission** Students must have a bachelor's degree with a major in Entomology, a biological science, Chemistry, Biochemistry, or a suitable equivalent. Regardless of undergraduate major, students must have had, or complete soon after entering graduate school, the following:

- One year of course work each in general biology, general chemistry, and organic chemistry.
- The equivalent of a one quarter course each in genetics and biochemistry.
- The equivalent of 30 quarter units of life sciences other than entomology. Students who wish to specialize in insect biochemistry, insect physiology, molecular entomology, neuroscience, or toxicology may substitute additional courses in physical, organic, and biological chemistry; toxicology; and pharmacology for courses in life sciences.

Credit from these courses does not count toward the unit requirement of the M.S. degree.

The department requires GRE General Test scores (verbal, quantitative, and analytical). All applicants whose first language is not English and do not have an undergraduate or graduate degree from an accredited institution where English is the exclusive language of instruction must submit a recent Test of English as a Foreign Language (TOEFL) and obtain a minimum score on the exam of 550 (paper-based), 213 (computer-based), or 80 (internet-based).

**Course Work** All students must take ENTM 201, ENTM 202, and ENTM 203.

**Normative Time to M.S.** 6 quarters

**Normative Time to Ph.D.** 17 quarters

## Opportunities for Interdisciplinary Graduate Study

Faculty from the Department of Entomology also participate in the following additional graduate programs:

- Biochemistry and Molecular Biology

- Cell, Molecular, and Developmental Biology (CMDB)
- Neuroscience
- Chemistry
- Environmental Toxicology
- Evolution, Ecology, and Organismal Biology (EEOB)
- Genetics, Genomics and Bioinformatics

These interdepartmental programs draw on the strengths of distinguished scientists from several units. For further information concerning work in these areas, see the respective program descriptions in the Programs and Courses section of this catalog or contact the Biological Sciences Graduate Student Affairs Center, at (800) 735-0717.

## Lower-Division Courses

**ENTM 010. Natural History of Insects (4) F, W, S** Lecture, 3 hours; demonstrations, 1 hour. A study of the fascinating world of insects and of their impact on man; designed for non-entomology majors. Living and preserved insects and many other visual aids are used.

**ENTM 020. Bees and Beekeeping (4) F, Odd Years** Lecture, 3 hours; discussion, 1 hour. Fundamentals of keeping honey bees, their fascinating social behavior, and their economic importance as pollinators of agricultural crops and as producers of honey and other products. Demonstrations of bee biology and behavior, with colonies of bees, and of beekeeping techniques, equipment, and extraction of honey. **Visscher**

## Upper-Division Courses

**ENTM 100. General Entomology (4) F, S** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BIOL 005C, or equivalents; or consent of instructor. Introductory study of insects, Earth's most diverse group of animals (75 percent of animal species are insects). Lecture covers the anatomy, physiology, ecology, behavior, and diversity of insects. Laboratory focuses on insect identification. Cross-listed with BIOL 100. **Walker**

**ENTM 106. Insect Evolution (3) S, Even Years** Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): BIOL 100/ENTM 100 or consent of instructor. Introduces principles of insect morphology, with emphasis on characters of phylogenetic and adaptive significance and insect evolution. Topics include the comparative anatomy and phylogenetic relationships of extinct and living insect groups. Laboratory emphasizes principles of comparative morphology and evolutionarily important character complexes.

**ENTM 107. Insect Biodiversity (4) W** Lecture, 2 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 100/ENTM 100 or consent of instructor. Introduces the science of insect systematics. Emphasizes the diagnostic characters of the major taxa and insect biodiversity. Laboratories focus on developing skills in insect identification to the family level. **Weirauch**

**ENTM 109. Field Entomology (4) S, Odd Years** Laboratory, 4 hours; field, 8 hours. Prerequisite(s): BIOL 100/ENTM 100 or equivalents or consent of instructor. Study and field collection of insects in selected ecological communities from the diversity of life zones comprising Southern California. Students

prepare specimens collected to professional standards, identify specimens, and submit their collections for grading and incorporation into the Department of Entomology's teaching and research collections. **Stouthamer**

**ENTM 111. Molecular Biology and Genomics of Human Disease Vectors (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A. Covers molecular biology and genomics of human disease vectors, predominantly insects. Analyzes molecular aspects of immunity, blood digestion, reproduction, and other systems specific to arthropod vectors. Explores recent advances in vector-pathogen interactions and their potentials for control. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with BCH 111. **Raikhel**

**ENTM 112. Systematics (4) S, Odd Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification: phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchy of categories, and nomenclature. Cross-listed with BIOL 112 and BPSC 112. **Heraty**

**ENTM 114. Aquatic Insects (4) S, Even Years** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C; or consent of instructor. Investigates aquatic insects as nutrient cyclers, pollution indicators, disease vectors, and fish food. Involves identification of major orders and families, morphological and physiological adaptations, and life history strategies. Laboratory emphasizes identification (collection) and includes a group field ecology project and two weekend field trips. **Mullens, Walton**

**ENTM 124. Agricultural Entomology (4) F, Odd Years** Laboratory, 4 hours; field, 8 hours. Prerequisite(s): BIOL 100/ENTM 100 or equivalent or consent of instructor. Identification, life history, ecology, distribution, and management of key pest and beneficial species learned through field observation, discussions with industry representatives, and laboratory study. Detailed notes and collections from field trips to all major growing regions of Southern California form the basis for laboratory discussion. **Perring**

**ENTM 125. Pesticides, Biological Organisms, and the Environment (3) F, Odd Years** Lecture, 3 hours. Prerequisite(s): two of the following Biology courses: BIOL 005A, BIOL 005B, BIOL 005C; CHEM 112A or CHEM 112B or CHEM 112C. An introduction to the chemistry, mode of action, and use of insecticides, acaricides, herbicides, and biopesticides from discovery to environmental interactions. Includes genetics of pesticide resistance development and government regulation. Cross-listed with ENTX 125 and PLPA 125. **Miller**

**ENTM 126. Medical and Veterinary Entomology (4) W** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BIOL 005C; or consent of instructor. Covers biology, ecology, and management of arthropods that affect human and animal health. Considers arthropods as direct pests and vectors of notorious diseases (e.g., malaria, plague). Also addresses disease epidemiology and prevention, as well as control of pests and associated diseases. **Gerry, Mullens**

**ENTM 127. Insect Ecology (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. Introduces principles of insect ecology with examples emphasizing the Arthropoda. Topics include factors governing population growth; ecological and evolutionary interactions with hosts, competitors, and natural

enemies; structure of ecological communities; and adaptations to different environments. Cross-listed with BIOL 127. **Walton**

**ENTM 129. Introduction to Biological Control (2) S, Odd Years** Lecture, 2 hours. Prerequisite(s): BIOL 100/ENTM 100 or consent of instructor. Principles and methods of biological control; biology and behavior of entomophagous insects; historical review and critique of important world projects. **Stouthamer**

**ENTM 129L. Introduction to Biological Control Laboratory (2) F** Laboratory, 6 hours. Prerequisite(s): ENTM 129 (it is strongly recommended that ENTM 129L be taken concurrently with ENTM 129). Laboratory identification of entomophagous insects; experiments designed to illustrate various types of parasitism; familiarization with mass rearing and culture techniques for entomophagous insects.

**ENTM 133. Urban Entomology (4) S, Even Years** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 100/ENTM 100 or consent of instructor. Biology and management of arthropod pests of the urban-industrial community with an emphasis on structural, household, and stored product pests. Exercises on the recognition and identification of these pests, their life histories, and strategies for their control. **Rust**

**ENTM 162. Insect Behavior (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C; or BIOL 100 /ENTM 100; or consent of instructor. An analysis of the mechanisms that cause and control behavioral reactions of insects. Emphasizes ethological and physiological knowledge concerning orientation mechanisms, communication systems, learning, and the role of the nervous system in integrating behavior in insects. Cross-listed with BIOL 162. **Carde**

**ENTM 173. Insect Physiology (4) S** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A and BIOL 005B or equivalents; CHEM 112A, CHEM 112B, CHEM 112C or equivalents; or consent of instructor. Introduction to principles of insect physiology. Subjects include growth, development and hormones, cuticle, nervous system, circulation, respiration, digestion, nutrition, excretion, reproduction, water balance, and temperature relations. Prior knowledge of insects is not assumed. Cross-listed with BIOL 173. **Miller, Thompson**

**ENTM 190. Special Studies (1-4) F, W, S** Individual study, 3-12 hours. Prerequisite(s): upper-division standing or consent of instructor. Directed studies by a faculty member to address specific curricular needs. Written report required. Course is repeatable as content changes to a maximum of 4 units.

**ENTM 197. Research for Undergraduates (1-4) F, W, S** Outside research, 3-12 hours. Prerequisite(s): upper-division standing or consent of instructor. Original research conducted under faculty supervision. Requires a formal oral presentation, poster project, or a written report. Course is repeatable.

**ENTM 199. Senior Research (1-4) F, W, S, Summer** Outside research, 3-12 hours. Prerequisite(s): senior standing; consent of instructor. Research in entomology performed under supervision of a faculty member. Requires a formal written report in the format of a research publication. Course is repeatable to a maximum of 6 units.

**ENTM 199H. Senior Honors Research (1-5) F, W, S** Laboratory, 3-15 hours. Prerequisite(s): senior status and consent of instructor; a GPA of 3.5 or better in entomology courses and 3.2 in all University course work. Research in entomology under supervision of a faculty member in entomology. The student will submit a written report. Course is repeatable.

## Graduate Courses

**ENTM 201. Core Areas of Entomology I: Subcellular-Cellular Disciplines (5) F** Lecture, 3 hours; laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100 or BCH 110A (may be taken concurrently); or consent of instructor. Introduces principles of molecular biology and insect physiology. Topics include genetic material and mechanisms, genomics, bioinformatics, gene control, genetic manipulations, endocrine and hormonal signaling, ecdysis, reproduction, and the muscle, nervous, and sensory systems. **Atkinson, Dahanukar, Raikhel, Ray**

**ENTM 202. Core Areas of Entomology II: Suborganismal-Organismal Disciplines (5) W** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): ENTM 201 or consent of instructor. Introduces principles of insect morphology, insect systematics, insect taxonomy, and physiology of systems used for energy transformation. Topics include comparative anatomy and functional morphology, digestion, excretion, osmoregulation, respiration, systematic theory, taxonomy, and insect identification. **Walker, Weirauch**

**ENTM 203. Core Areas of Entomology III: Supraorganismal Disciplines (5) S** Lecture, 4 hours; laboratory, 3 hours. Prerequisite(s): ENTM 202, undergraduate course in ecology; or consent of instructor. Introduces principles of insect ecology, genetics, evolution, behavior, and pest management. Addresses insect population dynamics and community interactions, genetics of geographic variation, insect behavior, and the management and control of pestiferous species. Includes computer simulations and use of molecular tools applied to supraorganismal phenomena. **Carde, Hare, Paine, Stouthamer**

**ENTM 207. Arthropod Vectors in Relation to Plant Disease (4) S, Even Years** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 100/ENTM 100, BIOL 120/MCBL 120/PLPA 120; or consent of instructor. Detailed analyses of interacting mechanisms involved in the transmission of plant pathogens by arthropods. Emphasis on learning through extensive laboratory experimentation. **Perring**

**ENTM 208. Host-Parasite Relationships (3) F, W, S** Lecture, 3 hours. Prerequisite(s): BIOL 100/ENTM 100 or BIOL 157 or consent of instructor. Explores the fundamental biochemical and developmental requirements for "successful" host-parasite relationships in insects. Emphasizes wasp and nematode parasites of insects and vector-parasite interactions involved in transmission of parasites in malaria, trypanosoma, and Lyme disease. Cross-listed with BIOL 208. **Beckage**

**ENTM 209. Microtechniques in Insect Morphology (3) W, Even Years** Laboratory, 6 hours; outside research, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 100/ENTM 100; or equivalents; or consent of instructor. Development of research techniques and skills used in the study of insect morphology. Covers the principles of and provides hands-on experience with the following: optical microscopy, scanning electron microscopy, whole-mount slide preparation techniques, morphometric measurement and analysis, scientific illustration, macrophotography, and histological techniques. **Walker**

**ENTM 210. Molecular Biology of Human Disease Vectors (3)** Lecture, 2 hours; seminar, 1 hour. Prerequisite(s): consent of instructor. Covers the molecular aspects of vectors transmitting most dangerous human diseases. Involves lectures and student

presentations about current issues in molecular biology and genomics of vector insects and pathogens they transmit. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 210 and MCBL 210. **Pedra, Raikhel**

**ENTM 212. Ecological Systems in Space and Time (4) F, W, S** Lecture, 3 hours; field, 30 hours per quarter. Prerequisite(s): BIOL 117 or BIOL 152/GEO 152 or equivalent or consent of instructor. Focuses on how ecological systems are interpreted and reconciled at the community, landscape, and paleontological scales. Addresses the role of extrinsic factors operating at each of these scales. Also examines the historical development of our understanding of ecological systems at various scales. Cross-listed with EEOB 212 and GEO 212.

**ENTM 219. Theory of Systematics (4) F, W, S** Lecture, 4 hours. Prerequisite(s): BIOL 112/BPSC 112/ENTM 112 or equivalent or consent of instructor. Examines topics developed around a series of classical and recent papers on the principles, philosophy, and methodology of modern systematics and phylogenetic methods. Cross-listed with EEOB 219 and GEO 219. **Heraty, Springer**

**ENTM 227. Insect Population Ecology (3) W, Odd Years** Lecture, 3 hours. Prerequisite(s): BIOL 127/ENTM 127 or consent of instructor. Recommended: ENTM 129; STAT 100A; STAT 100B or equivalent. Theory of animal population regulation. Factors affecting distribution and abundance of animals with emphasis on examples from the Arthropoda. **Luck**

**ENTM 229. Advanced Biological Control (4) F, Alternate Years** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 127/ENTM 127, ENTM 129, or equivalents, or consent of instructor. The lecture explores theory and practices relating to the use of natural enemies in the suppression of insect, weed, pathogen, and vertebrate populations. The laboratory surveys insect and other natural enemies, their attributes, collection, cultivation, quarantine handling, and field use. Normally letter graded, but students may petition the instructor for a Satisfactory (S) or No Credit (NC) grade.

**ENTM 230. Entomophagous Insects (4) F, Even Years** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 100/ENTM 100 or equivalent, graduate standing; or consent of instructor. Introduces the biology and identification of entomophagous insects. Students collect and rear parasites and prepare specimens according to professional standards. Laboratory identification focuses on the family level for parasitic insects. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. **Heraty**

**ENTM 231. Insect Pathology (4) S, Even Years** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 100/ENTM 100, at least one course in microbiology; or consent of instructor. Consideration of the principles of general insect pathology and microbiology. Detailed study of noninfectious and infectious diseases of insects, diagnosis, epizootiology, physiopathology, symptomatology, and the use of microbial agents in the control of insect pests. **Federici**

**ENTM 232. Molecular Biology of Insects (4) S, Even Years** Lecture, 3 hours; workshop, 1 hour. Prerequisite(s): BIOL 107A or consent of instructor. Application of molecular biology to entomology and entomological problems. Emphasizes how molecular biological tools are used to understand insect genome organization, pest resistance, transgenic insects, insect behavior, and insect systematics. **Atkinson**

**ENTM 240. Research Methods in Insect Chemical Ecology (4) W, Odd Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): consent of instructor. Survey of the methods used in the isolation, identification, and bioassay of biologically active natural products. Topics include bioassay design and execution, and microscale chemical separation and identification techniques. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **Millar**

**ENTM 241. Insect-Plant Interactions (4) F, Odd Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 127/ENTM 127 or consent of instructor. Concepts of the development and maintenance of ecological associations between plants and arthropod herbivores in ecological and evolutionary time; organization of arthropod communities on plants; phytochemical basis for the mediation of plant-arthropod associations; coevolution of plants and herbivorous insects; manipulation of plant-arthropod associations in arthropod pest management programs. **Hare, Trumble**

**ENTM 242. Development of Hypotheses and Research Design (3) F, W, S** Lecture, 1 hour; discussion, 1 hour; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Teaches fundamentals of research topic selection, development of hypotheses, and selection of experimental designs. Students prepare full-length federal grant proposals, then review and rank them in grant panel review format. **Millar, Trumble**

**ENTM 243. Advanced Insect Physiology, Biochemistry, and Molecular Biology (3) W, Even Years** Lecture, 2 hours; seminar, 1 hour. Prerequisite(s): BCH 211 or ENTM 232 or both ENTM 202 and ENTM 203; or consent of instructor. Explores the latest key issues of insect physiology, biochemistry, and molecular biology. **Raikhel**

**ENTM 249. Special Topics in Entomology (1-6)** Lecture, 1-6 hours; laboratory, 0-15 hours. Prerequisite(s): graduate standing or consent of instructor. Explores topics in entomology within the area of specialization of each faculty member. Content emphasizes recent advances in the special topic area and varies accordingly. Students who take examinations or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes.

**ENTM 250. Seminar in Entomology (1) F, W, S** Seminar, 1 hour. A series of lectures by visiting scientists, staff and advanced graduate students on research topics in entomology and allied fields. Graded Satisfactory (S) or No Credit (NC). **Stouthamer**

**ENTM 251. Seminar in Insect-Plant Interactions (2) W** Seminar, 2 hours. Prerequisite(s): ENTM 241 or consent of instructor. Rigorous examinations and interpretation of recent publications in the area of insect-plant interactions. Subject matter varies from year to year. Course may be taken more than once for credit. **Trumble**

**ENTM 252. Seminar in Insect Behavior (2) S** Seminar, 2 hours. Prerequisite(s): BIOL 162/ENTM 162 or consent of instructor. An analysis and interpretation of published experimental data dealing with insect behavior, and an attempt to derive general principles underlying behavior. Subject matter varies from year to year. Course is repeatable as content changes. **Carde, Millar, Visscher**

**ENTM 254. Seminar in Biological Control (2) F** Seminar, 2 hours. Prerequisite(s): BIOL 127/ENTM 127, ENTM 129; or consent of instructor. Concepts, questions and hypotheses in biological control.

Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. **Stouthamer**

**ENTM 255. Seminar in Medical and Veterinary Entomology (2) F** Seminar, 2 hours. Prerequisite(s): ENTM 126 or consent of instructor. Rigorous review and analysis of advanced topics in medical and veterinary entomology and related disciplines. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes. **Gerry, Mullens, Pedra, Walton**

**ENTM 256. Seminar in Systematic Entomology (2) S** Seminar, 2 hours. Prerequisite(s): BIOL 112/BPSC 112/ENTM 112 or consent of instructor. Selected topics in insect systematics. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes. **Heraty**

**ENTM 258. Seminar in Insect Pest Management (2) W** Seminar, 2 hours. Prerequisite(s): consent of instructor. Selected topics in insect pest management. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes. **Perring, Redak**

**ENTM 261. Seminar in Genetics, Genomics, and Bioinformatics (1) W, S** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, BPSC 261, GEN 261, and PLPA 261.

**ENTM 262. Seminar in Molecular Biology and Genomics of Disease Vectors (2), S** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Seminar series, sponsored by the Center for Disease-Vector Research at the Institute for Integrative Genome Biology, provides an opportunity for graduate students to discuss current issues of molecular biology and genomics of vector insects and pathogens they transmit with guest speakers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with MCBL 262. **Pedra, Raikhel**

**ENTM 271. Research Seminar in Management of Vegetable Crop Pests (1) W** Seminar, 1 hour. Prerequisite(s): consent of instructor. Seminar and critical discussion emphasizing current research and advances in management of vegetable crop pests. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. **Trumble**

**ENTM 272. Research Seminar in Insect Communication and Behavior (1) F, W, S** Seminar, 1 hour. Prerequisite(s): consent of instructor. Seminar and critical discussion emphasizing current research and advances in insect communication and behavior. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. **Carde, Millar, Visscher**

**ENTM 276. Research Seminar in Medical, Urban, and Veterinary Entomology (1) F, S** Seminar, 1 hour. Prerequisite(s): consent of instructor. Seminar and critical discussion emphasizing current research and advances in medical, urban, and veterinary entomology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. **Gerry, Mullens, Walton**

**ENTM 277. Research Seminar in Insect Biochemistry and Toxicology (1) F, W, S** Seminar, 1 hour. Prerequisite(s): consent of instructor. Seminar and critical discussion emphasizing current research and advances in insect biochemistry and toxicology.

Graded Satisfactory (S) or No Credit (NC). Course is repeatable. **Gill**

**ENTM 289. Special Topics in Neuroscience (2) F, W, S** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, BIOL 289, CHEM 289, NRSC 289, and PSYC 289. **Hatton**

**ENTM 290. Directed Studies (1-6) F, W, S** Literature studies on special topics under direction of a member of the staff. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ENTM 291. Individual Study in Coordinated Areas (1-6) F, W, S** Prerequisite(s): graduate standing. Faculty assisted programs of individual study for candidates who are preparing for examinations. The following rules apply: 1) Up to 6 units may be taken prior to award of the Master's degree, such units to be in addition to minimum unit requirements for the degree; 2) Up to 12 additional units may be taken prior to advancement to candidacy for the Ph.D.; 3) The course may be repeated within these limits. Graded Satisfactory (S) or No Credit (NC).

**ENTM 297. Directed Research (1-6) F, W, S** Exploratory research toward the development of the dissertation problem or other research not specifically for thesis or dissertation. Graded Satisfactory (S) or No Credit (NC).

**ENTM 299. Research for Thesis or Dissertation (1-12) F, W, S** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**ENTM 301. Teaching Entomology at the College Level (1) F, W, S** Seminar, 1 hour. Prerequisite(s): graduate standing in Entomology. A program of weekly meetings and individual formative evaluation required of new entomology Teaching Assistants. Covers instructional methods and classroom/section activities most suitable for teaching Entomology. Conducted by departmental faculty or the Teaching Assistant Development Program. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ENTM 302. College Teaching Practicum (1-4) F, W, S** practicum/consultation, 3-12 hours. Prerequisite(s): graduate standing and consent of instructor. Supervised teaching in college level classes under supervision of the course instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ENTM 303. Philosophy and Pedagogy of Teaching Undergraduate Life Sciences (3) F** Lecture, 1 hour; laboratory, 3 hours; workshop, 1 hour. Prerequisite(s): graduate standing in life sciences. Explores the opportunities and challenges associated with developing an undergraduate course in the life sciences. Emphasizes determining how students learn, as well as exploring contemporary instruction methods that foster student engagement in the classroom. Graded Satisfactory (S) or No Credit (NC). Cross-listed with BIOL 303. **Cardullo, Hammond, Paine**

# Environmental Engineering

See Chemical and Environmental Engineering

# Environmental Sciences

Subject abbreviation: ENSC  
College of Natural and Agricultural Sciences

Michael A. Anderson, Ph.D., Chair  
Christopher Amrhein, Ph.D., Vice-Chair  
John Herring, Student Affairs Assistant  
2258B Geology, (951) 827-2441;  
[john.herring@ucr.edu](mailto:john.herring@ucr.edu), [www.envisci.ucr.edu](http://www.envisci.ucr.edu)

## Professors

Christopher Amrhein, Ph.D. *Soil Chemistry*  
Michael A. Anderson, Ph.D. *Environmental Chemistry*  
Janet T. Arey, Ph.D. *Atmospheric Chemistry*  
Roger Atkinson, Ph.D. *Atmospheric Chemistry*  
David E. Crowley, Ph.D. *Soil Microbiology*  
Ariel Dinar, Ph.D., *Environmental Economics*  
Jianying "Jay" Gan, Ph.D. *Environmental Chemistry*  
Robert C. Graham, Ph.D. *Soil Mineralogy and Pedology*  
Keith C. Knapp, Ph.D. *Natural Resource Economics*  
David R. Parker, Ph.D. *Soil Biogeochemistry*  
Daniel Schlenk, Ph.D. *Aquatic Ecotoxicology*  
Jiri Simunek, Ph.D. *Hydrology*  
Laosheng Wu, Ph.D. *Soil Physics*  
Marylynn V. Yates, Ph.D. *Environmental Microbiology*  
Paul J. Ziemann, Ph.D. *Atmospheric Science*

## Professors Emeriti

Andrew C.-S. Chang, Ph.D. *Agricultural Engineering*  
Walter J. Farmer, Ph.D. *Soil Chemistry*  
William T. Frankenberger, Jr., Ph.D. *Soil Microbiology*  
William A. Jury, Ph.D. *Soil Physics*  
John Letey, Jr., Ph.D. *Soil Physics*  
Lanny J. Lund, Ph.D. *Soil Morphology, Genesis, and Classification*  
Albert L. Page, Ph.D. *Soil Chemistry*  
Roberto Sánchez-Rodríguez, Ph.D. *Environmental Policy*  
Henry J. Vaux, Jr., Ph.D. *Natural Resource Economics*

## Associate Professors

Kenneth A. Baerenklau, Ph.D. *Resource and Environmental Economics*  
David M. Crohn, Ph.D. *Biosystems Engineering*  
Kurt A. Schwabe, Ph.D. *Resource and Environmental Economics*  
James Sickman, Ph.D. *Watershed Hydrology and Biogeochemistry*

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## Major

The Department of Environmental Sciences offers B.A. and B.S. degrees in Environmental Sciences. Students can choose to concentrate their studies

in one of three options: Natural Science, Social Science, or Environmental Toxicology.

The necessity of maintaining an acceptable level of environmental quality is placing increasing demands upon governments and industries locally, nationally, and worldwide. To help meet those demands, the Environmental Sciences program is designed to provide training for students intending to enter environmental professions or for students preparing for graduate study in law, research, or teaching in a capacity that utilizes a background in the science of the human environment.

The structure of the Environmental Sciences curriculum provides a broad scope of instruction that enables students to explore the various disciplines and professions involved with solving environmental problems as well as opportunities for students to focus their training in accordance with their own educational and career objectives. All students majoring in Environmental Sciences must complete a set of "core requirements" consisting of courses that provide a basic understanding of the physical, biological, and social sciences and their application to the analysis of environmental processes and issues. In addition to the core requirements, students must complete the required courses and an appropriate number of elective courses as designated in the option they select. Students are not expected to select an option during the freshman year so that they can be introduced to dimensions of the environmental sciences about which they may have no previous knowledge. Those wishing to change their selection of an option may do so at any time as long as they are able to complete the requirements for the bachelor's degree within the 216-unit limit specified by the College of Natural and Agricultural Sciences.

### Joint Degree Program with California State University, Fresno

The Joint Degree Program with California State University, Fresno is not currently accepting new students. For more information, contact the Environmental Sciences Program Office, 3428 Pierce, (951)827-5103.

### Environmental Internship Program

The Environmental Internship Program offers students opportunities to work with government agencies, private firms, and nonprofit organizations involved in environmental affairs. As excursions into professional life, internships provide "hands-on" experience in applying the principles presented in courses. Beyond the highly specialized training associated with on-the-job activities, students can gain insights into their aptitudes, aspirations and work habits that enable them to clarify their academic and career objectives. Professional acquaintances established during internships can continue to serve as important contacts for students after the internship is completed.

Although most internships are part-time (12–15 hours per week) positions in the Riverside area, organizations that host student interns are located throughout the United States and in

Washington, D.C. Students working as interns may receive stipends, hourly wages, or serve as volunteers, depending upon the specific appointment. Up to 16 units of credit toward the bachelor's degree may be earned by developing an academic component of the internship in consultation with a faculty supervisor and enrolling in ENSC 198-I.

### Undergraduate Research

Students interested in enhancing the status of knowledge about environmental processes or seeking new solutions to environmental problems may gain training and experience as part-time employees in the department's research laboratories and other research facilities, such as the Air Pollution Research Center and the U.S. Department of Agriculture Soil and Water Research Service, located on campus. Those wishing to conduct their own research under faculty supervision may earn academic credit by enrolling in ENSC 197. Expenses for both laboratory and field experiments are eligible for funding by the campus mini-grant program which supports undergraduate research and creative activity.

### Environmental Toxicology Option

As a curriculum that emphasizes the chemistry and biochemistry of toxic substances in the environment, this option prepares students for careers dealing with the control of toxics in the environmental media of air, water, soil, and ecosystems and in such related fields as public health and industrial hygiene. Qualified students completing this option may enter UCR's graduate program in Environmental Toxicology without significant deficiencies in their undergraduate curriculum.

### Natural Science Option

As a general curriculum emphasizing the natural sciences, this option is suitable for students wishing to maintain a broad range of choices in technically oriented environmental professions such as air and water pollution control, hazardous materials management, public health, natural resource management, and environmental impact analysis. The Natural Science option is also appropriate as background for graduate study in such disciplines as ecology, forestry, air and water science, and environmental engineering. Students may earn either the B.A. or B.S. degree by completing the requirements specified by the College of Natural and Agricultural Sciences.

### Social Science Option

Developed for students whose interests are oriented toward the social context of the environmental sciences, this option is appropriate preparation for careers dealing with environmental regulation, land use planning, environmental impact analysis and administration of environmental protection programs. The Social Science option is also suitable for those intending to continue their education in such areas as natural resource economics, urban planning, and environmental law. Both the B.A.

and B.S. degrees are available to students in the Social Science option.

### California Teach-Science/Mathematics Initiative (CaTEACH-SMI)

California Teach-Science Mathematics Initiative (CaTEACH-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CaTEACH-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the SMI & Alpha Center Apprentice Program, to explore STEM teaching as a career option. Through CaTEACH-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CaTEACH-SMI Resource Center provides future STEM teachers with material and financial resources which includes the National Science Foundation (NSF) Noyce Scholarship Program, to promote planning and professional development towards a science/mathematics education career.

For more information about the CaTEACH-SMI program, please visit <http://smi.ucr.edu> or at the Resource Center at 1315 Pierce Hall.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the College's breadth requirements. Consult with a department advisor for course planning.

## Major Requirements

The major requirements for both the B.A. and the B.S. degrees in Environmental Sciences are as follows: Students must fulfill the core courses listed under the lower-division and upper-division requirements with a grade point average of 2.0 or better and no grade lower than a C-. If a grade of D or F is received in 2 or more core courses required for the major, either in separate courses or repetitions of the same course, the student may be discontinued from the major. Students must, under such circumstances, petition the department to remain in the major. Students are also required to choose one of the the options and satisfactorily complete the option requirements.

**Note** To gain maximum benefit from participating in the Undergraduate Research and Environmental Internship Programs, students intending to enroll in ENSC 197 and ENSC 198-I should contact their advisor during the quarter prior to enrollment in these courses.

**Core Requirements**

- Lower-division requirements (33 units)
  - ENSC 001, ENSC 002
  - CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
  - MATH 005
  - POSC 010
- Upper-division requirements (14 units): ENSC 100/SWSC 100, ENSC 101, ENSC 102, ENSC 191

**Environmental Toxicology Option**

(83-92 units)

- BIOL 005A, BIOL 05LA, BIOL 005B
- CHEM 005 or BIOL 005C; CHEM 112A, CHEM 112B, CHEM 112C
- ENTX 101, ENTX 154
- MATH 008B or MATH 009A, MATH 009B
- PHYS 002A, PHYS 002B, PHYS 002C
- PHYS 02LA, PHYS 02LB, PHYS 02LC are recommended
- ENSC 006/ECON 006 or ENSC 143A/ECON 143A (ECON 003 prerequisite)
- BCH 100 or both BCH 110A and BCH 110B; BIOL 102 or BIOL 121/MCBL 121; BCH 110C or BIOL 107A
- STAT 100A and STAT 100B
- Elective Courses: At least one course from ENSC 127/SWSC 127, ENSC 133/MCBL 133/SWSC 133, ENSC 135/CHEM 135/ENTX 135, ENSC 136/CHEM 136/ENTX 136/SWSC 136, ENSC 140/SWSC 140, ENSC 141/MCBL 141/SWSC 141, ENSC 142, ENSC 144/ENVE 144, ENSC 155, ENSC 163, BPSC 134/ENSC 134/SWSC 134, ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 138/GEO 138/SWSC 138, CBNS 150/ENTX 150, ENSC 197, ENSC 198-I

**Natural Science Option** (78–84 units)

- BIOL 005A, BIOL 05LA, BIOL 005B
- PHYS 002A, PHYS 002B, PHYS 002C
- PHYS 02LA, PHYS 02LB, PHYS 02LC are recommended
- MATH 008B or MATH 009A, MATH 009B
- CHEM 112A, CHEM 112B
- GEO 001 or GEO 002
- ENSC 006/ECON 006 or ENSC 143A/ECON 143A (ECON 003 prerequisite)
- STAT 100A and STAT 100B
- Elective Courses:
  - At least one course from BIOL 005C, CHEM 005, CHEM 112C, MATH 009C
  - A total of at least five courses from the following (at least three must be Env-

ironmental Sciences or Soil and Water Sciences)

ENSC 120/NEM 120/SWSC 120, ENSC 127/SWSC 127, ENSC 133/MCBL 133/SWSC 133, ENSC 135/CHEM 135/ENTX 135, ENSC 136/CHEM 136/ENTX 136/SWSC 136, ENSC 140/SWSC 140, ENSC 141/MCBL 141/SWSC 141, ENSC 142, ENSC 144/ENVE 144, ENSC 155, ENSC 163, ENSC 174, BPSC 134/ENSC 134/SWSC 134, ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 138/GEO 138/SWSC 138, ENSC 197, ENSC 198-I, BIOL 117, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 124/MCBL 124, BIOL 160, BIOL 163, BPSC 104/BIOL 104, CHEM 109, ENTX 101, GEO 157, GEO 162, GEO 167, GEO 168

**Social Science Option** (85–90 units)

- BIOL 002, BIOL 003
- MATH 022
- GEO 001 or GEO 002
- ECON 003
- ENSC 143A/ECON 143A, ENSC 143B/ECON 143B, ENSC 143C/ECON 143C, ENSC 172, ENSC 174
- ECON 101 or ECON 107
- STAT 100A and STAT 100B
- Elective Courses:
  - At least one course from ENSC 133/MCBL 133/SWSC 133, ENSC 140/SWSC 140, ENSC 141/MCBL 141/SWSC 141, ENSC 142, ENSC 144/ENVE 144, ENSC 155, ENSC 163, BPSC 134/ENSC 134/SWSC 134, ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 138/GEO 138/SWSC 138, ENSC 197, ENSC 198-I
  - A total of at least six courses from the following:
 

Economics: ECON 102A, ECON 102B, ECON 146, ECON 148, ECON 156, ECON 160/BUS 160

Society and culture: ANTH 132, ANTH 134, ANTH 135, ANTH 186/LNST 166, PHIL 117, SOC 137, SOC 143/URST 143, SOC 182/URST 182, SOC 184

Regulation and law: POSC 101, POSC 166, POSC 181, POSC 182, POSC 183

Management: BUS 104/STAT 104, BUS 122, GEO 157, GEO 167, MATH 120

**Minor**

The minor in Environmental Sciences consists of the following.

- Lower-division requirements (23 units)

- ENSC 002 or ENSC 017; ENSC 006/ECON 006
- CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC

- Upper-division requirements (20 units)

- ENSC 100/SWSC 100, ENSC 101, ENSC 102
- Eight (8) units of additional upper-division courses in Environmental Sciences, no more than 4 units of which are in courses numbered 190-198

Of the specified upper-division units, a minimum of 16 units must be unique to the minor and may not be used to satisfy major requirements.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

**Concentration Areas**

Students wishing to specialize in a particular science or discipline may do so by working with an advisor to select an appropriate sequence of elective courses within one of the required options. Sample areas of concentration and suggested courses are:

- Water science: ENSC 136/CHEM 136/ENTX 136/SWSC 136, ENSC 140/SWSC 140, ENSC 141/MCBL 141/SWSC 141, ENSC 142, ENSC 163
- Environmental chemistry: ENSC 104/SWSC 104, ENSC 135/CHEM 135/ENTX 135, ENSC 136/CHEM 136/ENTX 136/SWSC 136, CHEM 109, CHEM 125, CHEM 140, GEO 137
- Soil science: ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 120/SWSC 120/NEM 120, ENSC 127/SWSC 127, ENSC 134/SWSC 134/BPSC 134, ENSC 138/SWSC 138/GEO 138
- Environmental economics: ENSC 143A/ECON 143A, ENSC 143B/ECON 143B, ENSC 143C/ECON 143C, ECON 146, ECON 148, ECON 156

**Graduate Program****Subject abbreviation: ENSC**  
**College of Natural and Agricultural Sciences**

Michael A. Anderson, Ph.D., Director  
David Crowley, Ph.D., Graduate Advisor  
John Herring, Student Affairs Assistant  
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[envisci.ucr.edu](http://envisci.ucr.edu)

The Environmental Sciences Graduate Program offers the M.S. and Ph.D. degrees in Environmental Sciences.

Advanced training in Environmental Sciences is becoming increasingly necessary to address complex problems involving natural resources and environmental quality. Although this task frequently requires specialized knowledge in various fields of science, it also requires understanding and integration of a wide variety of interacting physical, chemical, biological, and societal influences. This interaction makes graduate study in environmental sciences distinct from many other scientific fields.

We have designed our program to offer advanced training in a number of specialized field areas within environmental sciences, operating within a single graduate degree program administered by the Department of Environmental Sciences. Students trained in the Environmental Sciences Graduate Program can fill many areas of expertise needed in the state and nation. Potential career opportunities exist at regulatory agencies, consulting firms, government and academic research institutions, and industrial research facilities.

**Admission** Entry to the program requires completion of a baccalaureate degree in a field appropriate as preparation for graduate study in environmental sciences. Students normally will come to the program from an environmental sciences related discipline such as atmospheric science, aquatic science, earth science, environmental chemistry, hydrology, or soil science; a basic science such as biology, chemistry, or physics; or in a social science discipline such as economics, political science, geography, or sociology. Students may conduct research under the supervision of a sponsoring faculty member in any of the following field areas. Students must specify a field area for entry into the program.

In addition to the following requirements, all applicants must meet the general requirements as set forth in this catalog under the Graduate Studies section.

**Environmental Chemistry and Ecotoxicology** The Environmental Chemistry and Ecotoxicology field area focuses on the sources, physical and chemical transformations, and removal processes of chemicals in soil, water, and air, and their impacts on ecological systems.

**Entrance requirements** There are no entrance requirements for the Environmental Chemistry area beyond the general requirements for admission to the ESGP. For Ecotoxicology, prospective students would be expected to have had courses in General Biology/Zoology and Organic Chemistry. Students who do not have sufficient background to take the core course or specific elective courses may, however, need to first take prerequisite courses.

**Environmental Microbiology** The Environmental Microbiology field area encompasses the study of microbial processes in natural and agricultural ecosystems and the effects of microorganisms on environmental processes and environmental quality. Research topics include funda-

mental research on microbial physiology, genetics, and ecology as related to the environment, applied research on microbial effects on the fate and transport of pollutants, anthropogenic effects on microbial communities, fate and transport of human pathogenic microorganisms in the environment, and the application of microorganisms and microbial assays as indicators of soil and water quality.

**Entrance requirements** Students admitted to the Environmental Microbiology field area are expected to have a baccalaureate degree in biology, microbiology, or closely related field or demonstration of extensive background in biology and microbiology. Recommended prior course work includes chemistry (general, organic, and biochemistry), biology (general and advanced course work), microbiology (general), and statistics (general). Deficiencies in these areas must be remedied during the first year of graduate school.

**Environmental and Natural Resource Economics and Policy** The economics and policy field area focuses on the human aspects of environmental problems. Coursework emphasizes training in the traditional areas of environmental and natural resource economics, including welfare theory, externalities, pollution control, resource extraction, and non-market valuation, but also in sustainability, environmental management, and environmental policy. Research topics could include the environmental impacts of agriculture, transportation and urbanization, land use in poor and industrialized countries, international trade and the environment, climate change, and methodological advances in non-market valuation, to name just a few. Training in this field enables a student to analyze and address a wide variety of environmental policy issues.

**Entrance requirements** Students admitted to the Environmental and Natural Resource Economics and Policy field area normally will have completed a baccalaureate degree in the natural sciences, social sciences, or engineering. At least two undergraduate courses in economics and statistics are recommended. Students who do not have sufficient background to take the core courses or field courses may need to first take prerequisite courses.

**Soil and Water Sciences** The Soil and Water Science field area offers comprehensive training in the chemistry, physics, biology, and ecology of soils, surface waters and wetlands. Students can specialize in a variety of areas, including soil and aquatic chemistry, hydrology, limnology, soil-plant relations, biogeochemistry, bioremediation, geomicrobiology, contaminant fate and transport, water resources management, hillslope processes, soil genesis, soil mineralogy and geomorphology, and related areas.

**Entrance requirements** Admission to the Soil and Water Sciences field area requires a baccalaureate degree with preparation in both physical and life sciences. It is recommended that students have completed one year of gen-

eral chemistry, as well as courses in general physics, organic chemistry, calculus through integrals, general biology, statistics, and physical geology or physical geography.

**Environmental Sciences and Management** The Environmental Sciences and Management field area is designed to serve students seeking interdisciplinary training in environmental research. Students enrolled in this field area will be expected to pursue a rigorous research plan that involves research in one or more of the following areas: science, management, or policy. Students will have the opportunity to select study committees from a spectrum of environmental disciplines.

**Entrance requirements** There are no additional entrance requirements for this field area beyond those to enter the graduate program.

**Course Work** The Ph.D. and M.S. degree programs both require completion of the courses given below, which are specific to each field area. Students with a M.S. objective may need to take additional courses to fulfill the requirements of the **Plan I (Thesis)** or **Plan II (Comprehensive Examination)** options. Upon acceptance to the program, the student will select an Advisory Committee made up of three members of the participating faculty in the ESGP to assist in the planning of the individualized curriculum. Electives are chosen in consultation with the Advisory Committee. Students also must attend a seminar each quarter (to be chosen in consultation with the major advisor). There is no foreign language requirement for the program.

#### **Environmental Chemistry and Ecotoxicology**

All students must complete one core course: ENSC 200/ENTX 200/CHEM 246.

Students focusing on **Environmental Chemistry** must complete 4 electives from the following list, of which at least 2 must be at the graduate level:

ENSC 104, ENSC 127/SWSC 127, ENSC 133/SWSC 133/MCBL 133, ENSC 135/ENTX 135/CHEM 135, ENSC 136/ENTX 136/CHEM 136/SWSC 136, ENSC 214/SWSC 214, ENSC 217/SWSC 217, ENSC 224/SWSC 224, ENSC 225/SWSC 225, ENSC 232/SWSC 232, ENTX 200L, ENTX 244/CHEM 244, ENTX 245/CHEM 245/SWSC 245, SWSC 203, SWSC 204.

Students focusing on **Ecotoxicology** must complete: ENTX 201 and ENTX 208 and take at least two electives from the following list, one of which must be at the graduate level: ENSC 214/SWSC 214, ENSC 217/SWSC 217, ENSC 224/SWSC 224, ENSC 225/SWSC 225, ENSC 232/SWSC 232, ENTX 200L, ENTX 244/CHEM 244, ENTX 245/CHEM 245/SWSC 245, SWSC 203, SWSC 204, ENTX 154, ENTX 205.

**Environmental Microbiology** Students must complete the following core courses: MCBL 201, MCBL 221, MCBL 211, and at least 4 elective courses (or 12 credit hours), three of which must be at the graduate level.

**Environmental and Natural Resource Economics and Policy** Course requirements include: core

course sequences consisting of ECON 200A, ECON 200B, ECON 200C and ECON 205A, ECON 205B, ECON 205C; field course sequence consisting of ECON 207, ECON 208, ECON 209; and three elective courses comprised of upper division undergraduate courses and/or graduate courses approved by their advisor. Students must earn a satisfactory score on the doctoral cumulative examination in microeconomic theory, attain a "B" average in each of the core and field course sequences, and pass the doctoral qualifying examination with written and oral components.

No student will be given more than three attempts to achieve a satisfactory grade on the microeconomic theory cumulative examination. Any unexcused absences from the required examinations will be regarded as a failure.

**Soil and Water Sciences** Students must complete one course in each of the following core course groups.

#### Chemistry

ENSC 104/SWSC 104  
CHEM 136/ENSC 136/ENTX 136/SWSC 136

#### Physics

ENSC 107/SWSC 107  
ENSC 163

#### Biology

ENSC/MCBL/SWSC 133  
BPSC 134/ENSC 134/SWSC 134  
ENSC 141/MCBL 141/SWSC 141

#### Natural Structure and Diversity

ENSC 138/GEO 138/SWSC 138  
ENSC 140/SWSC 140

Students may have completed these prior to admission or they may take them early in their graduate program. Students must present a departmental seminar summarizing results of their thesis or dissertation or internship during the final quarter of matriculation.

#### Environmental Sciences and Management

Because students enrolled in this field area may carry out interdisciplinary research for their advanced degree, the graduate course plan will be individualized. It is expected that the student and his/her Advisory Committee will design a course plan that includes graduate environmental science, management, and/or policy courses. The student will be required to take 6 courses (24 units), 3 of which must be at the graduate level.

### Master's Degree

The Department of Environmental Sciences offers the M.S. degree in Environmental Sciences under the Plan I (Thesis) and Plan II (Comprehensive Examination) options. The general requirements for the M.S. degree are found in the Graduate Studies section of the General Catalog. All students are required to give a presentation annually at the Environmental Sciences Graduate Program Student Symposium.

**Plan I (Thesis)** Plan I (Thesis) Students must complete a minimum of 36 quarter units of graduate and upper-division undergraduate courses in, or significantly related to, Environmental Sciences. These must include the course requirements given above for the specific field area. At least 24 of the 36 units must be in graduate courses. A maximum of 12 of these units may be in graduate research for the thesis. No more than 4 units of ENSC 290 and 2 units of graduate seminar courses may be applied toward the degree. A thesis must be written and accepted by the M.S. thesis committee members, and a final oral defense of the thesis must be passed.

**Plan II (Comprehensive Examination)** Students must complete a minimum of 36 quarter units of graduate and upper-division undergraduate courses in, or significantly related to, Environmental Sciences. These must include the course requirements given above for the specific field area. At least 18 units must be in graduate courses. Students may count no more than 2 units of graduate seminar courses and 6 units of graduate internship courses toward the required 18 units and no units from graduate research for thesis or dissertation. Students must take a comprehensive written examination that covers fundamental topics in environmental sciences. The written examination, which is three to four hours long, is prepared and evaluated by a committee appointed by the field director. The examination is taken during the latter part of the final quarter in the M.S. program. Students must wait at least eight weeks before retaking a failed examination. Students failing the examination twice are dismissed from the program.

**Normative Time to Degree** 2 years

### Doctoral Degree

The Department of Environmental Sciences offers the Ph.D. degree in Environmental Sciences. The general requirements for the Ph.D. degree are found in the Graduate Studies section of the General Catalog.

**Course Work** Students must complete the course requirements given above for the specific field area. All students are required to give a presentation annually at the Environmental Sciences Graduate Program Student Symposium.

**Ph.D. Written Qualifying Examination** Following completion of all course work prescribed by the student's Advisory Committee, a Ph.D. Written Qualifying Examination will be prepared and administered to the student by a Ph.D. Written Qualifying Examination Committee. The Ph.D. Written Qualifying Examination Committee will consist of at least three faculty members with interests in the student's line of research. The purpose of this examination is to determine that the student has gained sufficient knowledge in the chosen field to perform professionally and competently. This exam may be attempted only twice. If this exam is failed twice, the student may be redirected to the M.S. degree if the student does not already

hold an M.S. in Environmental Sciences or terminated from the program.

**Ph.D. Oral Qualifying Examination** A student who satisfactorily passes the Ph.D. Written Qualifying Examination may proceed with the Ph.D. Oral Qualifying Examination, which will focus on the dissertation proposal. This examination is conducted before the Oral Qualifying Examination Committee, consisting of five faculty members, one of whom must be from outside the ESGP. This examination may be attempted only twice. If this exam is failed twice, the student will be redirected to the M.S. degree if the student does not already hold an M.S. in Environmental Sciences or terminated from the program. The Ph.D. Written and Oral Qualifying Examinations will normally be taken at the end of the second year of graduate study and before the start of the third year.

**Dissertation** All Ph.D. students must write a doctoral dissertation, which must be read and accepted by all members of the Doctoral Dissertation Committee, comprised of at least three faculty members from the ESGP. A final oral dissertation defense in front of at least three Doctoral Dissertation Committee members may be required.

**Relationship between Master's and Doctoral Programs** The M.S. and Ph.D. programs are separate. Students who enter the Ph.D. program do not need to acquire a M.S. degree first, although students may elect to take both.

**Normative Time to Degree** 5 years

## Lower-Division Courses

**ENSC 001. Introduction to Environmental Science: Natural Resources (4) F** Lecture, 3 hours; discussion, 1 hour. An introduction to environmental science, focusing on natural resource description, management, and conservation. Topics covered include ecosystem characteristics and function; material and energy flows; population dynamics and influence of population on the environment; energy resources and conservation; and mineral and soil resources and their management. Credit is awarded for only one of ENSC 001 or ENSC 001H. **Sickman**

**ENSC 001H. Honors Introduction to Environmental Science: Natural Resources (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ENSC 001. An introduction to environmental science, focusing on natural resource description, management, and conservation. Topics covered include ecosystem characteristics and function; material and energy flows; population dynamics and influence of population on the environment; energy resources and conservation; and mineral and soil resources and their management. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ENSC 001 or ENSC 001H. **Sickman**

**ENSC 002. Introduction to Environmental Science: Environmental Quality (4) W** Lecture, 3 hours; discussion, 1 hour. An introduction to environmental science, focusing on the impact of human development and technology on the quality of natural resources and living organisms. Topics covered include soil, water, and air pollution; water, land, and food

resources; wildlife management and species endangerment; toxicology and risk management; and solid and hazardous waste management. Credit is awarded for only one of ENSC 002 or ENSC 002H. **Crowley**

**ENSC 002H. Honors Introduction to Environmental Science: Environmental Quality (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ENSC 002. An introduction to environmental science, focusing on the impact of human development and technology on the quality of natural resources and living organisms. Topics covered include soil, water, and air pollution; water, land, and food resources; wildlife management and species endangerment; toxicology and risk management; and solid and hazardous waste management. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ENSC 002 or ENSC 002H. **Crowley**

**ENSC 003. Contemporary Issues in the Environmental Sciences (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An issue-oriented approach to understanding the scientific principles behind environmental issues. Case studies of environmental issues appearing in the mass media provide the context for assessing the status of scientific knowledge and its role in human decision making. Credit awarded for only one of ENSC 003 or ENSC 003H. **Crohn**

**ENSC 003H. Honors Contemporary Issues in the Environmental Sciences (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ENSC 003. An issue-oriented approach to understanding the scientific principles behind environmental issues. Case studies of environmental issues appearing in the mass media provide the context for assessing the status of scientific knowledge and its role in human decision making. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ENSC 003 or ENSC 003H. **Crohn**

**ENSC 006. Introduction to Environmental Economics (4) F, S** Lecture, 3 hours; discussion, 1 hour. An introduction to the basic principles of economics and their application to problems of environmental quality and natural resource utilization. Emphasis is on the failure of markets as a cause of environmental degradation and the role of government in resolving problems of resource scarcity. Does not satisfy the Natural Science breadth requirement for the College of Humanities, Arts, and Social Sciences. Cross-listed with ECON 006. **Schwabe**

**ENSC 017. Environmental Impacts of Urbanization (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): none. Lectures and simulation exercises illustrating applications of principles from the physical and biological sciences to the analysis of urban systems and their impact on air and water quality, ecosystems, and reciprocal impacts at the urban-rural interface. Opportunities and constraints for mitigating the environmental impacts of urbanization.

**ENSC 092. Exploring Environmental Sciences (1) F** Seminar, 1 hour. Familiarizes students with the fields of natural resource conservation, environmental regulation, and environmental restoration. Examines employment opportunities in government, university, and private business settings to participate in the development of sustainable interactions between humans and the environment. Graded Satisfactory (S) or No Credit (NC).

## Upper-Division Courses

**ENSC 100. Introduction to Soil Science (4) F** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; GEO 001 is recommended. Explores the fundamental principles of soil science and soils as a natural resource. An introduction to the morphology, physics, chemistry, microbiology, fertility, classification, development, and management of soils in relation to the environment. Cross-listed with SWSC 100. Credit is awarded for only one of ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H. **Amrhein**

**ENSC 100H. Honors Introduction to Soil Science (4) F** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; GEO 001 is recommended. Honors course corresponding to ENSC 100. Explores the fundamental principles of soil science and soils as a natural resource. An introduction to the morphology, physics, chemistry, microbiology, fertility, classification, development, and management of soils in relation to the environment. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with SWSC 100H. Credit is awarded for only one of ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H. **Amrhein**

**ENSC 101. Water Resources (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 001 or ENSC 001H, ENSC 002 or ENSC 002H; or consent of instructor. An introduction to the hydrologic cycle; water sources, distribution, and transfer; and the physical, chemical, and biological properties of water. Discussion of water management and policy issues. **Anderson**

**ENSC 102. Introductory Atmospheric Science (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC. Covers the structure of the atmosphere and the impact of humans on it, including the causes and consequences of air pollution, air quality standards, and stratospheric and tropospheric ozone. Introduces the chemistry of air pollution and air pollution control strategies. **Arey**

**ENSC 104. Environmental Soil Chemistry (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 or ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H or consent of instructor. Quantitative study of the chemistry of the solid, liquid, and gas phases in soils and sediments. Topics include solid and solution speciation, mineral solubility, ion exchange and adsorption reactions, oxidation-reduction, and the chemistry of organic contaminants and toxic trace elements in soils. Cross-listed with SWSC 104.

**ENSC 107. Soil Physics (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B or MATH 09HB; PHYS 002A; or consent of instructor. Topics include physical properties of soils and methods of evaluation. Emphasis is on movement of water, heat, gases, and chemicals through soil. Cross-listed with SWSC 107. **Simunek**

**ENSC 120. Soil Ecology (3) S** Lecture, 3 hours. Prerequisite(s): BIOL 002 or both BIOL 005A and BIOL 05LA; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC. Examination of soil biota and their relationships with plants and the soil environment. Emphasis is on soil biotic interactions that influence soil fertility, plant disease, and plant growth. Examines the importance of the different microbial and faunal groups from the rhizosphere to

the ecosystem level. Cross-listed with NEM 120 and SWSC 120. **Crowley, DeLey**

**ENSC 127. Fate and Transport of Contaminants in Soil (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; MATH 009B or MATH 09HB. Topics include interactions of environmental conditions with abiotic and biotic transformation and transport of major organic and inorganic contaminants in soil. Cross-listed with SWSC 127. **Gan**

**ENSC 133. Environmental Microbiology (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C; or consent of instructor. Introduction to nonpathogenic microorganisms in the environment. Topics include an introduction to microbial biology and microbial and metabolic genetic diversity; methods; symbiotic interactions; biofilms; and geomicrobiology and biogeochemistry. Explores life in extreme environments and the effects of the physical and chemical environment on microbes. Cross-listed with MCBL 133 and SWSC 133. **M. Allen**

**ENSC 134. Soil Conditions and Plant Growth (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104, ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; or consent of instructor. A study of the chemical, physical, and biological properties of soils and their influence on plant growth and development. Topics include soil-plant water relations; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses and rhizosphere processes. Cross-listed with BPSC 134 and SWSC 134. **Crowley**

**ENSC 135. Chemistry of the Clean and Polluted Atmosphere (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 112A, CHEM 112B, or consent of instructor; ENSC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric NO<sub>x</sub> chemistry; methane oxidation cycle; phase distributions of chemicals; wet and dry deposition; chemistry of volatile organic compounds; formation of photochemical air pollution; modeling of air pollution and control strategies; stratospheric ozone depletion and global warming. Cross-listed with CHEM 135 and ENTX 135. **Ziemann**

**ENSC 136. Chemistry of Natural Waters (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 with a grade of "C-" or better or ENSC 104/SWSC 104 with a grade of "C-" or better or consent of instructor. Introduction to processes controlling the chemical composition of natural waters. Topics include chemical equilibria, acid-base and coordination chemistry, oxidation-reduction reactions, precipitation-dissolution, air-water exchange, and use of equilibrium and kinetic models for describing marine nutrient, trace metal, and sediment chemistry. Cross-listed with CHEM 136, ENTX 136, and SWSC 136. **Parker**

**ENSC 138. Soils of Natural Ecosystems and Landforms (4) S** Lecture, 3 hours; laboratory, 4 hours per quarter; one half-day field trip and three 1-day field trips. Prerequisite(s): ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; GEO 001 or GEO 002; or consent of instructor. The study of soils in diverse natural environments. Examines how soils form and their roles in ecosystem function and landscape processes. Includes causes of soil variability, fundamentals of soil classification, and indicators of current and past environmental conditions. Field trips emphasize the description and interpretation of soils. Cross-listed with GEO 138 and SWSC 138. **Graham**

**ENSC 140. Limnology (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; ENSC 101. Study of surface waters. Considers in detail the physical and chemical processes in surface waters, aquatic biology, ecosystem dynamics, and aspects of surface water quality and modeling. Cross-listed with SWSC 140. **Anderson**

**ENSC 141. Public Health Microbiology (4) F** Lecture, 4 hours. Prerequisite(s): BIOL 002 or both BIOL 005A and BIOL 05LA; BIOL 003 or BIOL 005B; upper-division standing; or consent of instructor. Introduction to transmission of human pathogenic microorganisms through environmental media, including drinking water, wastewater, and air. Topics include characterization of environmentally transmitted pathogens, microbial risk assessment, sampling and detection methods for microorganisms in environmental samples, waterborne disease outbreaks, recycling or re-use of wastewater, microbial regulations and standards, and indoor air microbiology. Cross-listed with MCBL 141 and SWSC 141. **Yates**

**ENSC 142. Water Quality (4) S** Lecture, 4 hours. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; ENSC 101; upper-division standing or consent of instructor. Topics include principles and practices of water pollution control; basic concepts of water quality management; and the chemistry and physics of water purification processes.

**ENSC 143A. Environmental Economics (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 003 or ECON 004 or equivalent, MATH 022 or equivalent; or consent of instructor. Introduction to economic analysis of natural resources and the environment with emphasis on environmental quality. Topics include environment-economy interactions and social choice theory; source control costs, damage valuation, and efficient pollution control; and design of efficient and equitable environmental policy. Cross-listed with ECON 143A. **Schwabe**

**ENSC 143B. Natural Resource Economics (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 143A/ENSC 143A or consent of instructor. Considers the extraction and use of natural resources. Topics include land use and natural capital economics and valuation; economics of mineral and nonrenewable resources including recycling; and managing biological and renewable resources, including common property, efficient usage, and regulation. Cross-listed with ECON 143B. **Dinar**

**ENSC 143C. Ecological Economics and Environmental Valuation (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 143A/ENSC 143A or consent of instructor. Survey of environmental valuation and economy-wide, long time-scale issues. Valuation methods covered include hedonic pricing, weak complements, contingent valuation, and ecosystem services. Environmental macroeconomic topics include population growth, biophysical constraints to economic growth, intertemporal welfare and sustainability, and sustainable development. Cross-listed with ECON 143C. **Knapp**

**ENSC 144. Solid Waste Management (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002 or both BIOL 005A and BIOL 05LA; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; either both ENSC 001 (or ENSC 001H) and ENSC 002 (or ENSC 002H) or ENVE 171; MATH 009B (or MATH 09HB) or MATH 022; or consent of instructor. A study of the characterization, collection, transportation, processing, disposal, recycling, and composting of municipal solid waste. Emphasizes

accepted management strategies and design procedures for recovering or disposing solid wastes while protecting public and environmental well-being. Cross-listed with ENVE 144. **Crohn**

**ENSC 155. Principles and Applications of Bioremediation (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002, BIOL 003, or equivalents; ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H. A study of the principles, applications, and case histories of biological treatment in the cleanup of hazardous chemicals. Topics include remediation of contaminated soils, sediments, sludges, groundwater, and vapors.

**ENSC 163. Hydrology (4) W** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 009B or MATH 09HB; STAT 100B; or consent of instructor. Introduction to the scientific study of the hydrologic cycle. Covers the measurement and evaluation of hydrologic phenomena, including the use of statistical methods. Explores computer techniques in hydrology with applications to water resource development and water quality problems, particularly those in California. The laboratory includes field and computer assignments. **Sickman**

**ENSC 172. Principles of Environmental Impact Analysis (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 006/ENSC 006; ENSC 001 or ENSC 001H; ENSC 002 or ENSC 002H. Principles and theories of analyzing environmental interactions. Critical analysis of methodologies for assessing the physical, biological and social impacts on the environment by human activities. Synthesis of the subject matter through preparation of an environmental impact report.

**ENSC 174. Law, Institutions, and the Environment (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 001 or ENSC 001H; ENSC 002 or ENSC 002H; or consent of instructor. Introduction to the important and complex issues of natural resource ownership, protection, and regulation in the institutional environment of local, state, and federal laws, implementing agencies, and competing interests in environmental protection. Decision making is examined in the context of the rights and limits of both private parties and the broad public interest in the use and protection of natural resources.

**ENSC 190. Special Studies (1-5) F, W, S** variable hours. Prerequisite(s): upper-division standing and consent of instructor. Special studies as a means of meeting special curricular problems. Graded Satisfactory (S) or No Credit (NC); however, students may petition the instructor for a letter grade. Course is repeatable.

**ENSC 191. Seminar in Professional Development in Environmental Sciences (2) F, W, S** Seminar, 2 hours. Prerequisite(s): upper-division standing in Environmental Sciences or consent of instructor. Lectures and discussions on scientific writing, critical analysis in reading, public speaking, job interview and resume preparation, and professional conduct. Students make both written and oral presentations on topics in Environmental Sciences.

**ENSC 197. Research for Undergraduates (1-4) F, W, S** variable hours. Prerequisite(s): upper-division standing and consent of instructor. Individual research on a problem relating to environmental science to be conducted under the guidance of an instructor. Graded Satisfactory (S) or No Credit (NC); however, students may petition the instructor for a letter grade. Course is repeatable.

**ENSC 198-I. Internship in Environmental Sciences (1-12) F, W, S** Field, 3-36 hours. Prerequisite(s): upper-division standing; ENSC 001 or ENSC 001H or equivalent;

ENSC 002 or ENSC 002H or equivalent. An academic internship, involving participation in a functional capacity in the enhancement or maintenance of environmental quality, conducted under the joint supervision of an off-campus sponsor and a faculty member in Environmental Sciences. A final written report based on the internship experience is required. One unit of credit for every three hours per week spent in internship. Graded Satisfactory (S) or No Credit (NC), but in exceptional cases student may petition for a letter grade. Course is repeatable to a maximum of 16 units.

## Graduate Courses

**ENSC 200. Fate and Transport of Chemicals in the Environment (4) S** Lecture, 4 hours. Prerequisite(s): CHEM 109 or CHEM 110B; CHEM 112A, CHEM 112B, CHEM 112C; or consent of instructor. Covers the identification of toxicants and their sources in the environment; equilibrium partitioning of chemicals in the environment (between air, water, soil, sediment, and biota) using physico-chemical properties; and the transport and chemical transformations of chemical compounds in air, water, and soil media. Includes case studies of fate and transport of selected toxic chemicals. Cross-listed with CHEM 246 and ENTX 200.

**ENSC 201. Environmental Management (4) S, Odd Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 003 or consent of instructor. An introduction to economic instruments used to make environmental policy to address pollution control and natural resource protection on local and international scales. Investigates public and private incentives for single and multiple polluters to reduce pollution and conserve exhaustible and renewable resources.

**ENSC 202. Principles and Applications of Environmental Modeling (4) W, Alternate Even Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduction to the principles of transport modeling, including mass balance and flux laws, boundary conditions, and rate processes. Discusses and demonstrates the use of compartmental and differential models of specific environmental processes. Also examines case studies and environmental modeling software applications. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**ENSC 205. Functional Diversity of Prokaryotes (3)** Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BIOL 121/MCBL 121; or equivalents; or consent of instructor. In-depth coverage of bacterial and archaeal bioenergetics, cell structure, diversity of metabolism, regulation of metabolism, growth, and biosynthesis, and cell-cell interactions between prokaryotes and eukaryotes. Project involves analysis of metabolic pathways from complete, annotated, prokaryotic genome sequences. Cross-listed with MCBL 201 and PLPA 201.

**ENSC 206. Environmental Policy and Law (4) S, Even Years** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing, POSC 010 or POSC 010H, POSC 020 or POSC 020H; or consent of instructor. An introduction to the process and politics of environmental regulation in the United States and the negotiation and implementation of international environmental accords. Uses social scientific methods of analysis to investigate specific issues such as air quality, energy, and biodiversity. Cross-listed with POSC 206. **Allison**

**ENSC 207. Surface Water Quality Modeling (4) W, Odd Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduction to the principles of surface water quality

modeling. Explores mathematical representations of surface water systems. Reviews theory and develops analytical and numerical solutions to describe hydrodynamics and mixing in surface waters, surface water quality, eutrophication, and the cycling and fate of contaminants in lake and river ecosystems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. **Anderson**

**ENSC 208. Ecotoxicology (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, CHEM 112A, CHEM 112B; or consent of instructor. Introduction to the impact of chemicals upon ecological systems. Examination of the fate and effects of environmental chemicals in various hierarchies of biological organization to learn how to carry out precise and accurate assessments of ecological risk. Cross-listed with ENTX 208 and SWSC 208.

**Schlenk**

**ENSC 214. Soil and Water Chemistry Laboratory (2)** Laboratory, 6 hours. Prerequisite(s): concurrent enrollment in ENSC 104/SWSC 104 or consent of instructor. A series of advanced laboratory exercises involving modern analytical methods for soils, sediments, and surface waters. Topics include trace metal speciation, isotope exchange kinetics, mineral solubility, adsorption isotherms, redox couples, and partitioning and biodegradation of organic contaminants. Cross-listed with SWSC 214.

**ENSC 217. Vadose Zone Processes (4) W, Even Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B or MATH 09HB, ENSC 107/SWSC 107; or consent of instructor. A study of physical and mathematical descriptions of transient flow and transport processes in the vadose zone. Emphasis is on numerical solutions to equations describing the movement of water, gas, contaminants and heat, including chemical and biological reactions. Explores mathematical models for direct and inverse solutions, spatial heterogeneity, and determination of soil hydraulic properties. Cross-listed with SWSC 217. **Simunek**

**ENSC 218. Isotopes in Ecology and Environmental Science (4) F, Odd Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC. Explores the principles and techniques of isotope tracer fractionation and mixing commonly used in ecology and environmental science. Introduces isotope notation, mixing models, and kinetic and equilibrium fractionation concepts. Includes case studies involving stable- and radioisotopes of carbon, nitrogen, oxygen, and sulfur. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 4 units. **Sickman**

**ENSC 227. Global Change and the Earth System (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor; ENSC 232/SWSC 232 is recommended. Examines the fundamental principles of earth system science in the context of global change. Emphasizes contemporary research on the relationship between humans and the Earth's environment. Topics include the earth system prior to human influence; the Anthropocene era (1850 to present); the responses of the Earth's support machinery to human activities; consequences of global change for human well-being; and pathways towards global sustainability. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ENSC 232. Biogeochemistry (4) W, Odd Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. A study of the biogeochemical cycling and exchange of carbon and important nutrients (N, S, base cations) between the litho-

sphere, hydrosphere, and atmosphere. Quantitatively describes processes at scales ranging from local to global. Addresses modern concerns about water and atmospheric quality, including global climate change. Cross-listed with SWSC 232. **Parker**

**ENSC 265. Special Topics in Earth and Environmental Sciences (1-3) F, W, S** Seminar, 1-3 hours. Prerequisite(s): graduate standing. Involves oral presentations and small-group discussions of selected topics in the areas of biogeochemistry, global climate change, geomicrobiology, earth surface processes, and interplanetary life. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 10 units. Cross-listed with GEO 265.

**ENSC 275. Research Seminar in Environmental Sciences (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Involves seminars by faculty, visiting scholars, environmental professionals, and advanced graduate students on current research topics in Environmental Sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ENSC 290. Directed Studies (1-6)** Consultation, 1-3 hours; individual study, 1-15 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study of selected topics in Environmental Sciences under faculty direction. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ENSC 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Individual research performed under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ENSC 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. Research in environmental sciences for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**ENSC 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): graduate standing. Supervised teaching in Environmental Sciences or related courses. Required of all teaching assistants in Environmental Sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

# Environmental Toxicology

**Subject abbreviation:** ENTX  
**College of Natural and Agricultural Sciences**

Yinsheng Wang, Ph.D.,  
Chair and Program Director  
Program Office, 1140 Batchelor Hall  
(800) 735-7017 or (951) 827-4116  
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### Professors

Michael E. Adams, Ph.D. *Neurosciences*  
(Entomology/Cell Biology and Neuroscience)  
Michael F. Allen, Ph.D. *Plant Pathology/Biology*  
(Plant Pathology)

Janet T. Arey, Ph.D. *Atmospheric Chemistry*  
(Environmental Sciences)  
Roger Atkinson, Ph.D. *Atmospheric Chemistry*  
(Environmental Sciences)  
Wilfred Chen, Ph.D., *Chemical Engineering*  
(Chemical and Environmental Engineering)  
Quan "Jason" Cheng, Ph.D. *Analytical Materials*  
(Chemistry)  
Carl F. Cranor, Ph.D. *Regulation of Toxic Substances* (Philosophy)  
David E. Crowley, Ph.D. *Environmental Microbiology* (Environmental Sciences)  
David A. Eastmond, Ph.D. *Toxicology*  
(Cell Biology and Neuroscience)  
Jianying "Jay" Gan, Ph.D. *Water Quality*  
(Environmental Sciences)  
Sarjeet S. Gill, Ph.D. *Toxicology*  
(Cell Biology and Neuroscience)  
Cynthia K. Larive, Ph.D. *Analytical Chemistry*  
(Chemistry)  
Xuan Liu, Ph.D. *Transcription Regulation*  
(Chemistry)  
Ernest Martinez, Ph.D. *Molecular Biology*  
(Biochemistry)  
Manuela Martins Green, Ph.D., (Cell Biology and Neuroscience)  
Ashok K. Mulchandani, Ph.D. *Biosensors*  
(Chemical and Environmental Engineering)  
David R. Parker, Ph.D. *Biogeochemistry*  
(Environmental Sciences)  
Daniel Schlenk, Ph.D. *Aquatic Ecotoxicology*  
(Environmental Sciences)  
Frances M. Sladek, Ph.D. *Transcriptional Regulation* (Cell Biology and Neuroscience)  
Prudence Talbot, Ph.D. *Cell Biology*  
(Cell Biology and Neuroscience)  
Yinsheng Wang, Ph.D. *Biological Mass Spectrometry* (Chemistry)  
Yushan Yan, Ph.D. *Environmental Engineering*  
(Chemical and Environmental Engineering)  
Marylynn V. Yates, Ph.D. *Environmental Microbiology* (Environmental Sciences)  
Paul J. Ziemann, Ph.D. *Atmospheric Chemistry*  
(Environmental Sciences)

### Associate Professors

Jeffrey B. Bachant, Ph.D. *Chromosome Segregation* (Cell Biology and Neuroscience)  
Margarita C. Currás-Collazo, Ph.D. *Neurosciences*  
(Cell Biology and Neuroscience)  
Constance Nugent, Ph.D. *Telomere Replication*  
(Cell Biology and Neuroscience)  
Mihri Ozkan, Ph.D. *Nanoelectronics and Nanoprobes* (Electrical Engineering)

### Assistant Professors

Sharon Walker, Ph.D. *Environmental Engineering*  
(Chemical and Environmental Engineering)  
Nicole I. zur Nieden, Ph.D. *Embryonic Stem Cells*  
(Cell Biology and Neuroscience)  
Wenwan Zhong, Ph.D. *Analytical Chemistry*  
(Chemistry)

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### Lecturer

Robert Krieger, Ph.D. *Pesticide Toxicology*  
(Entomology)

## Graduate Program

The program offers the M.S. and Ph.D. degrees in Environmental Toxicology.

The interdepartmental graduate program in Environmental Toxicology has participating faculty from the departments of Biochemistry, Cell Biology and Neuroscience, Chemical and Environmental Engineering, Chemistry, Ent-

omology, Electrical Engineering, Environmental Sciences, Philosophy, Plant Pathology and Microbiology, as well as scientists from the Air Pollution Research Center.

The goal of the program is to train toxicologists capable of directing research in areas of environmental toxicology. Areas of specialization include biochemical toxicology and chemical toxicology. To attain this goal, a three-tiered curriculum has been designed whereby students must complete

1. A core of courses in environmental toxicology: ENSC 200/ENTX 200/CHEM 246, ENTX 201, ENTX 201L, ENTX 202, ENTX 270
2. A selection of elective courses in environmental toxicology and other relevant fields chosen in consultation with the student's major professor and the Guidance Committee to develop depth in particular areas of specialization
3. Research training in specific areas of environmental toxicology

The program stresses the importance of innovative and independent laboratory research as the major component of the student's education.

**Admission** Students must have a B.A. or B.S. degree from an accredited institution and an academic record that satisfies the minimum admission standards established by the UCR Graduate Division. In addition, results from the GRE General Test (verbal, quantitative, analytical) must be submitted at the time of application. Although no specific undergraduate degree specialization is required, applicants should have adequate backgrounds in the basic physical sciences such as chemistry, physics, and mathematics as well as in the biological sciences.

**Course Work** Normally, students admitted to regular standing have satisfied all prerequisite course work. Under special circumstances, students who have not completed all undergraduate requirements may be admitted provided that these deficiencies are corrected early in their graduate studies. Deficiencies must be corrected by taking the appropriate course work if undergraduate or other previous training has not included equivalent courses to the following:

BIOL 005A, BIOL 05LA, BIOL 005B

BCH 100 or both BCH 110A and BCH 110B; BCH 110C or BIOL 107A

CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, CHEM 005, CHEM 112A, CHEM 112B, CHEM 112C

CHEM 109 or CHEM 110A; CHEM 110B or CHEM 109; and BCH 184 (exceptions depend on biochemical or chemical emphasis)

MATH 008B or MATH 009A, MATH 009B

PHYS 002A, PHYS 002B, PHYS 002C

STAT 100A and STAT 100B

Students who meet all the undergraduate entrance requirements should be able to complete the core Environmental Toxicology requirements in the first year and most electives by the end of the second year.

**Laboratory Rotation** All students participate in laboratory rotation through enrollment in ENTX 201L. Students spend time in one laboratory per quarter familiarizing themselves with research techniques utilized in the laboratory of an Environmental Toxicology faculty member. Rotation laboratories are chosen in consultation with the graduate advisor and individual faculty members. Students may enroll in up to three quarters of laboratory rotation before declaring a major professor. Students who wish to declare a major professor after one quarter are not required to enroll for additional laboratory rotation. The major professor serves as chair of the student's Guidance and Dissertation committees.

**Guidance Committee** Each graduate student establishes a guidance committee which participates in the annual student progress evaluation procedure and advises the student on curriculum and research. The committee consists of the major professor plus at least two other faculty, one of whom must be a member of the Environmental Toxicology Program. Each student, in consultation with the major professor, nominates the members of the guidance committee. The committee must be named by the end of the quarter in which the student selects a major professor. The composition of the guidance committee must be approved by the curriculum and student affairs committee.

## Master's Degree

The program offers the M.S. degree in Environmental Toxicology.

Students enrolling in the master's degree program must meet the requirements for the Plan I of the UCR Graduate Council, take core courses as described above, and submit an acceptable thesis.

**Plan I (Thesis)** Thirty-six (36) units, of which 24 must be in graduate-level courses, are required. No more than 12 units of ENTX 290, ENTX 297, and ENTX 299 may be used to satisfy the unit requirement. All students must enroll in the Environmental Toxicology seminar (ENTX 270 and ENTX 271) each quarter offered, although no more than 3 units from seminar courses can be accrued towards degree credit. A final draft of the thesis is to be given to the thesis committee two weeks before the final oral examination. A final oral examination consists of an open research seminar, presented by the candidate and advertised to all the students and faculty in the Environmental Toxicology Program. Following the seminar, the student is questioned by the guidance committee on the thesis research and on matters related to the general field of the thesis research.

**Normative Time to Degree** 6 quarters

## Doctoral Degree

The program offers the Ph.D. degree in Environmental Toxicology.

Students must meet general university requirements of the Graduate Division as found in the Graduate Studies section of this catalog.

**Course Work** Beyond the required core sequence, all students must enroll in the Environmental Toxicology seminar (ENTX 270 and ENTX 271) each quarter offered, and complete a program of courses to be approved by the guidance committee. All course work schedules are submitted to the graduate advisor for approval. The Ph.D. degree is awarded when the student passes the preliminary and qualifying examinations and demonstrates an ability to do original research by preparation and submission of an acceptable dissertation.

**Preliminary Examination** The preliminary examination is a standardized, written test generally offered once a year prior to the beginning of the fall quarter. Students normally take it following the completion of the core curriculum. The examination must be satisfactorily completed in order to enroll for the seventh academic quarter in the Ph.D. program. The examination consists of questions related to environmental, organismal and suborganismal aspects of toxicology. These questions are designed to test the student's ability to synthesize and integrate concepts in toxicology, rather than merely reiterate the material covered in the Environmental Toxicology core curriculum. The examination is administered by a committee consisting of the faculty members involved in teaching the core curriculum. On the basis of the results of this examination, the committee recommends appointment of a faculty qualifying committee, additional course work in specific area(s) of weakness, transfer to a terminal master's program, or withdrawal from the program. In exceptional circumstances, the preliminary examination can be taken a second time.

**Oral Qualifying Examination** The qualifying examination is an oral examination conducted by the qualifying committee. The qualifying committee, appointed by the graduate dean from nominations made by the faculty, is composed of the student's major professor and four additional members, one of whom must be from outside the Graduate Environmental Toxicology group. It covers the student's area of specialization and research field as well as general subjects at the discretion of the qualifying committee. The qualifying examination must be successfully completed by the end of the ninth quarter of full-time enrollment in the Ph.D. program. Under exceptional circumstances, the qualifying examination may be taken a second time. Upon successful completion of the qualifying examination, the student is advanced to candidacy.

**Dissertation and Final Oral Examination** A dissertation committee composed of at least three members is appointed by the graduate dean shortly after advancement to candidacy. Students

must submit a dissertation based on independent, original research acceptable to all dissertation committee members. A final draft of the dissertation is to be given to the committee two weeks before the dissertation defense seminar.

Before approval of the dissertation, students must present their research orally at a thesis defense seminar. The seminar must be advertised to the campus community and is open to all who wish to attend. Following the seminar, the student is questioned by the dissertation committee on the thesis research and on matters related to the general field of the thesis research.

**Teaching Requirement** Ph.D. students must fulfill a two-quarter teaching requirement.

**Normative Time to Degree** 15 quarters

## Upper-Division Courses

**ENTX 101. Fundamental Toxicology (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, CHEM 112A, CHEM 112B, CHEM 112C; or consent of instructor. Fundamental concepts relating to the adverse effects of chemical agents. Topics covered include dose-response relationships, absorption, distribution, metabolism, excretion, mechanisms of toxicity, and the effects of selected environmental toxicants on various organ systems. Characterization and assessment of risks are also covered. **Schlenk**

**ENTX 125. Pesticides, Biological Organisms, and the Environment (3)** Lecture, 3 hours. Prerequisite(s): two of the following Biology courses: BIOL 005A, BIOL 005B, BIOL 005C; CHEM 112A or CHEM 112B or CHEM 112C. An introduction to the chemistry, mode of action, and use of insecticides, acaricides, herbicides, and biopesticides from discovery to environmental interactions. Includes genetics of pesticide resistance development and government regulation. Cross-listed with ENTM 125 and PLPA 125. **Miller**

**ENTX 135. Chemistry of the Clean and Polluted Atmosphere (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 112A, CHEM 112B, or consent of instructor; ENSC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric NO<sub>x</sub> chemistry; methane oxidation cycle; phase distributions of chemicals; wet and dry deposition; chemistry of volatile organic compounds; formation of photochemical air pollution; modeling of air pollution and control strategies; stratospheric ozone depletion and global warming. Cross-listed with CHEM 135 and ENSC 135. **Ziemann**

**ENTX 136. Chemistry of Natural Waters (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 with a grade of "C-" or better or ENSC 104 /SWSC 104 with a grade of "C-" or better or consent of instructor. Introduction to processes controlling the chemical composition of natural waters. Topics include chemical equilibria, acid-base and coordination chemistry, oxidation-reduction reactions, precipitation-dissolution, air-water exchange, and use of equilibrium and kinetic models for describing marine nutrient, trace metal, and sediment chemistry. Cross-listed with CHEM 136, ENSC 136, and SWSC 136. **Parker**

**ENTX 150. Cancer Biology (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; CBNS 101 is recommended (may be taken

concurrently). The origin, development, and treatment of cancer are explored with emphasis on molecular mechanisms. Topics such as oncogenes, tumor suppressors, cell cycle and differentiation, AIDS, and heredity and environmental factors in the development of cancer are covered. Cross-listed with CBNS 150. **Sladek**

**ENTX 154. Risk Assessment (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENTX 101; STAT 100A or equivalent; or consent of instructor. An introduction to the basic principles and methods by which health risks associated with exposure to chemical and physical agents are determined. Topics include hazard identification, dose response and exposure assessments, as well as risk characterization and management. **Eastmond**

## Graduate Courses

**ENTX 200. Fate and Transport of Chemicals in the Environment (4) S** Lecture, 4 hours. Prerequisite(s): CHEM 109 or CHEM 110B; CHEM 112A, CHEM 112B, CHEM 112C; or consent of instructor. Covers the identification of toxicants and their source in the environment; equilibrium partitioning of chemicals in the environment (between air, water, soil, sediment, and biota) using physicochemical properties; and the transport and chemical transformations of chemical compounds in air, water, and soil media. Includes case studies of fate and transport of selected toxic chemicals. Cross-listed with CHEM 246 and ENSC 200. **Atkinson**

**ENTX 200L. Analysis and Identification of Environmental Toxicants (3) W, Odd Years** Lecture, 1 hour; laboratory, 6 hours. Prerequisite(s): CHEM 125 (lecture portion only), CHEM 246/ENSC 200/ENTX 200; or consent of instructor. Provides laboratory experience in specialized methods of identification and analysis of toxic organic compounds in gaseous, aqueous, and soil media. Methods of sample collection and extraction are presented. Students utilize both gas and liquid chromatographic techniques. Toxicant analysis by gas chromatography (GC), GC/mass spectrometry, and GC/Fourier transform infrared spectroscopy is emphasized. **Arey**

**ENTX 201. Principles of Toxicology (4) F** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A, BCH 110B; or consent of instructor. The structure-activity and dose-response relationships of environmental toxicants; their absorption, distribution, metabolism, and excretion; and evaluation of their toxicity and factors that influence toxicity. Quantitative methods in measuring acute and chronic toxicity. **Eastmond**

**ENTX 201L. Laboratory Rotation (2) F, W, S** Laboratory, 6 hours. Prerequisite(s): graduate standing in Environmental Toxicology. Introduction to research techniques in biochemical and chemical toxicology. Students will spend time in a laboratory to familiarize themselves with research topics and techniques. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. **Eastmond**

**ENTX 202. Mechanisms of Toxicity (4) W** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; ENTX 201; or consent of instructor. Biochemical and physiology mechanisms underlying the toxicity of environmental toxicants. The interaction of toxicants with subcellular components and macromolecules with emphasis on mechanism of action, in particular neurotoxicity of pesticides, chemical carcinogenesis, mutagenesis, and teratogenicity. **Gill, Grosovsky**

**ENTX 204. Genome Maintenance and Stability (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 113 or BIOL 114 or CBNS 101; BIOL 102 is strongly recommended. Emphasizes chromosome-based processes that maintain genome integrity and ensure accurate genome transmission during cell division. Topics are drawn from the primary literature and include chromatin structure and composition, DNA repair and recombination, telomere function and chromosome maintenance, mitotic chromosome segregation, and checkpoint surveillance mechanisms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BCH 204 and CMDB 204.

**ENTX 205. Biotransformation of Organic Chemicals (4) S** Lecture, 4 hours. Prerequisite(s): CHEM 112A; CHEM 112B; BCH 110A, BCH 110B, BCH 110C, or equivalents; or consent of instructor. Explores the catalytic activities and regulatory pathways of Phase I (e.g., cytochromes P450) and Phase II (e.g., Uridine Diphosphate Glucuronosyl-Transferase) enzymes involved in organic chemical biotransformation. Demonstrates the contribution of biotransformation in toxicology. **Schlenk**

**ENTX 208. Ecotoxicology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, CHEM 112A, CHEM 112B; or consent of instructor. Introduction to the impact of chemicals upon ecological systems. Examination of the fate and effects of environmental chemicals in various hierarchies of biological organization to learn how to carry out precise and accurate assessments of ecological risk. Cross-listed with ENSC 208 and SWSC 208. **Schlenk**

**ENTX 211. Environmental and Molecular Carcinogenesis (3)** Lecture, 3 hours. Prerequisite(s): BIOL 107A or equivalent or consent of instructor. Molecular genetics of human cell response to environmental carcinogens. Discussions of DNA repair, mutagenesis, oncogenes, and tumor suppressors. Following presentation of introductory material, emphasis will be placed on student discussion of recent literature.

**ENTX 245. Chemistry and Physics of Aerosols (3) F, Odd Years** Lecture, 3 hours. Prerequisite(s): CHEM 109, CHEM 110B; or consent of instructor. Fundamentals of chemical and physical processes controlling behavior and properties of airborne particles. Topics include particle mechanics; electrical, optical, and thermodynamic properties; nucleation; surface and aqueous-phase chemistry; gas-particle partitioning; sampling; size and chemical analysis; atmospheric aerosols; and environmental effects. Cross-listed with CHEM 245 and SWSC 245. **Ziemann**

**ENTX 252. Special Topics in Environmental Toxicology (1-3) F, W, S** Seminar, 1-3 hours. Prerequisite(s): graduate standing. Involves oral presentations and intensive small-group discussions of selected topics in the area of special competence of each participant. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 20 units.

**ENTX 270. Seminar in Environmental Toxicology (1) F, W, S** Seminar, 1 hour. Prerequisite(s): graduate status in Environmental Toxicology. Lectures by visiting scholars and staff on current research topics in Environmental Toxicology. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit. **Eastmond**

**ENTX 271. Seminar in Environmental Toxicology (2) S** Seminar, 15 hours per quarter; individual study, 15-20 hours per quarter. Prerequisite(s): graduate standing in Environmental Toxicology. An interdisciplinary

seminar consisting of student presentations of original research and discussion of current research topics in environmental toxicology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 12 units.

**ENTX 290. Directed Studies (1-6) F, W, S** Outside research, 3-18 hours. Prerequisite(s): graduate status in Environmental Toxicology. Literature or research topics under direction of the staff. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**ENTX 297. Directed Research (1-6) F, W, S** Outside research, 3-18 hours. Prerequisite(s): graduate status in Environmental Toxicology. Directed research performed towards the development of a dissertation problem or other research performed under the direction of staff. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**ENTX 299. Research for Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate status in Environmental Toxicology. Research performed under the direction of a faculty member towards a thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

## Ethnic Studies

**Subject abbreviation: ETST**

**College of Humanities, Arts, and Social Sciences**

Dylan Rodriguez, Ph.D., Chair  
Department Office, 4033 INTN  
(951) 827-4707; [ethnicstudies.ucr.edu](http://ethnicstudies.ucr.edu)

### Professors

Edward T. Chang, Ph.D. Asian American Studies  
Alfredo M. Mirandé, Ph.D. Chicano Studies  
(Ethnic Studies/Sociology)  
Armando Navarro, Ph.D. Chicano Studies  
Dylan Rodriguez, Ph.D. Filipino American  
Studies/Prison Industrial Complex

### Professor Emerita

Edna M. Bonacich, Ph.D. Race, Class, and Gender  
(Ethnic Studies/Sociology)

### Associate Professor

Jayna Brown, Ph.D. African American Studies  
Ralph L. Crowder, Ph.D. African American Studies  
Paul Green, Ph.D. Race, Education, and Law  
Jodi Kim, Ph.D. Asian American Studies  
Anthony Macias, Ph.D. Chicano Studies

### Assistant Professors

Victoria Bomberry, Ph.D. Native American Studies  
Jennifer Najera, Ph.D. Chicano Studies  
Robert Perez, Ph.D. Native American Studies

## Majors

Ethnic Studies is the systematic and comparative study of the social construction of race, racism, and racial or ethnic subordination, and the history, culture, and contemporary experiences of racial or ethnic groups who have not been fully incorporated into U.S. society. The Department of Ethnic Studies focuses on the experiences of four racial or ethnic groups (African Americans, Asian Americans, Chicana/o and Latinas/os, and Native Americans) whose histories, cultures, and experiences have been neglected by traditional disciplines. Ethnic studies students examine inter- and intra-group differences and commonalities in history, culture, racism, the

impact of law, and social inequality in contemporary society. Also examined are conflicts, tensions, and the building of effective inter-group coalitions and alliances among racially subordinated groups.

The Department of Ethnic Studies offers majors leading to a B.A. degree in Ethnic Studies, African American Studies, Asian American Studies, Chicano Studies, and Native American Studies. Students may develop either a general emphasis in Ethnic Studies or a concentration on a specific group. The major enables students to study race and ethnicity in comparative perspective, to gain greater multicultural insight and understanding, and to prepare them to enter the workforce and function effectively and critically as informed citizens in a diverse multicultural society.

With the changing ethnic composition of society is a growing demand for individuals in education, government, and the private sector with knowledge and expertise in race and ethnic relations. An Ethnic Studies major also helps to prepare students for graduate or professional school and careers in a number of areas including education, corrections, law, human services, social welfare, urban planning, and state and county government.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The Ethnic Studies Department offers a B.A. degree in Ethnic Studies, African American Studies, Asian American Studies, Chicano Studies, or Native American Studies.

### Ethnic Studies Major

The major requirements for the B.A. degree in Ethnic Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units)
  - a) ETST 001
  - b) Two courses chosen from ETST 002, ETST 003, ETST 005, or ETST 007
2. Upper-division requirements (40 units)
  - a) ETST 101A or ETST 101B
  - b) ETST 100 or ETST 131
  - c) ETST 191R
  - d) Three courses chosen from three of the following areas of emphasis:
    - (1) African American Studies
    - (2) Asian American Studies
    - (3) Chicano Studies
    - (4) Native American Studies
  - e) Four courses chosen from Ethnic Studies courses that are comparative in nature

**Note** No internship courses may be counted toward the upper-division electives in Ethnic Studies.

### African American Studies Major

The major requirements for the B.A. degree in African American Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units)
  - a) ETST 001
  - b) ETST 003
  - c) One chosen from ETST 002, ETST 005, or ETST 007
2. Upper-division requirements (40 units)
  - a) ETST 101A or ETST 101B
  - b) ETST 100 or ETST 131
  - c) ETST 109-I and ETST 191R
  - d) Sixteen (16) additional upper-division units in Ethnic Studies chosen from courses focusing on the African American experience
  - e) A minimum of one Ethnic Studies course chosen from two of the following four areas of emphasis (8 units)
    - (1) Asian American Studies
    - (2) Chicano Studies
    - (3) Native American Studies
    - (4) Comparative Issues

**Note** No internship courses may be counted toward the upper-division electives in Ethnic Studies.

### Asian American Studies Major

The major requirements for the B.A. degree in Asian American Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units)
  - a) ETST 001
  - b) ETST 005
  - c) One chosen from ETST 002, ETST 003 or ETST 007
2. Upper-division requirements (40 units)
  - a) ETST 101A or ETST 101B
  - b) ETST 100 or ETST 131
  - c) ETST 106 and ETST 191R
  - d) Sixteen (16) additional upper-division units in Ethnic Studies chosen from courses focusing on the Asian American experience
  - e) A minimum of one Ethnic Studies course chosen from two of the following four areas of emphasis (8 units)
    - (1) African American Studies
    - (2) Chicano Studies
    - (3) Native American Studies
    - (4) Comparative Issues

**Note** No internship courses may be counted toward the upper-division electives in Ethnic Studies.

### Chicano Studies Major

The major requirements for the B.A. degree in Chicano Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units):  
ETST 001, ETST 002 and ETST 004/HIST 004
2. Upper-division requirements (40 units)
  - a) ETST 100A or ETST 101B
  - b) ETST 100 or ETST 131
  - c) ETST 191R
  - d) Four courses selected from two of the following areas of emphasis (16 units):
    - (1) Law  
ETST 145/SOC 145, ETST 126, ETST 128/SOC 128, ETST 185, ETST 108-I
    - (2) Politics  
ETST 123, ETST 125, ETST 111, ETST 132, ETST 142, ETST 156
    - (3) History and Culture  
ETST 155, ETST 108E, ETST 108F, ETST 108-I, ETST 108P, ETST 122, ETST 125, ETST 128/SOC 128, ETST 146/EDUC 146, ETST 153/LNST 153, ETST 154, ETST 161, ETST 166
    - (4) Gender  
ETST 124, ETST 114, ETST 127, ETST 175/WMST 175
  - e) One Senior Research Seminar (4 units)
  - f) One Internship course (4 units)
  - g) One additional elective upper-division course in Ethnic Studies

**Note** No internship courses may be counted toward the upper-division electives in Ethnic Studies.

### Native American Studies Major

The major requirements for the B.A. degree in Native American Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units)
  - a) ETST 001
  - b) ETST 007
  - c) One chosen from ETST 002, ETST 003 or ETST 005
2. Upper-division requirements (40 units)
  - a) ETST 101A or ETST 101B
  - b) ETST 100 or ETST 131
  - c) ETST 157, ETST 158 and ETST 191R
  - d) Sixteen (16) additional upper-division units in Ethnic Studies chosen from courses focusing on the Native American experience

- e) One Ethnic Studies course chosen from one of the following four areas of emphasis (4 units)
  - (1) African American Studies
  - (2) Asian American Studies
  - (3) Chicano Studies
  - (4) Comparative Issues

**Note** No internship courses may be counted toward the upper-division electives in Ethnic Studies.

### Minors

The Ethnic Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units):  
ETST 001
2. Upper-division requirements (20 units)
  - a) ETST 100, ETST 131
  - b) Twelve (12) additional upper-division units in Ethnic Studies courses that are either comparative in nature or focus on African Americans, Asian Americans, Chicanos, or Native Americans (Courses must be approved by Ethnic Studies advisor.)

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

### African American Studies Minor

The African American Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units):  
ETST 003
2. Upper-division requirements: 20 additional upper-division units in Ethnic Studies chosen from courses focusing on African Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

### Asian American Studies Minor

The Asian American Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units):  
ETST 005
2. Upper-division requirements: 20 additional upper-division units in Ethnic Studies chosen from courses focusing on Asian Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

### Chicano Studies Minor

The Chicano Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units):  
ETST 002 or ETST 004/HIST 004
2. Upper-division requirements: 20 additional upper-division units in Ethnic Studies chosen from courses focusing on Chicanos

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

### Native American Studies Minor

The Native American Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units):  
ETST 007
2. Upper-division requirements: 20 additional upper-division units in Ethnic Studies chosen from courses focusing on Native Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

### Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

### Graduate Program

The Department of Ethnic Studies offers M.A. and Ph.D. degrees in the interdisciplinary field of Ethnic Studies. The M.A. degree is awarded as part of a student's required progress towards the Ph.D. degree. Students proceed through the graduate program from coursework to exams to fieldwork and writing the dissertation. The graduate program prepares students for teaching and research careers in the private and public sector.

### Doctoral Degree

**Admission** Students are admitted for the fall quarter of each academic year only. The basic requirement for admission into the Ph.D. Program is a bachelor's degree or its equivalent from an accredited institution with a major in any subject field.

Admission to the graduate program is based on the following criteria:

1. Prior academic performance, especially in undergraduate or graduate classes in Ethnic Studies or related fields.
2. Performance on the Graduate Record Examination.
3. Letters of recommendation from at least three persons familiar with an applicant's potential for achieving academic excellence. Two of the letters must be from professors in the applicant's major subject.
4. Compatibility between applicant's areas of interest and department's research and teaching emphases.
5. Quality of the writing sample. Applicants must submit a scholarly paper not to exceed 15-double spaced pages, such as a term paper, section of a thesis, or published work.
6. Completed application and materials (including transcripts) required from Graduate Division.

The Ethnic Studies website at [www.ethnicstudies.ucr.edu](http://www.ethnicstudies.ucr.edu) provides more details on the Ph.D. program, degree requirements, and application procedures. General Graduate Division university requirements are available on the Graduate Division website at [www.graduatedivision.ucr.edu](http://www.graduatedivision.ucr.edu) and in the Graduate Studies section of this catalog.

**Coursework** All students, including those who have a master's degree at the time of admission, must complete the basic core curriculum.

**Course Requirements** The core Ethnic Studies graduate curriculum consists of two theory courses (ETST 200 and 201), one methodology course (ETST 203), and a graduate proseminar on professionalization (ETST 405). Where appropriate, students are encouraged to take an additional course in methodology (quantitative or qualitative), in addition to ETST 203. Students are also required to enroll in and attend the Ethnic Studies Colloquium during each quarter of the first two years of graduate work.

During the second year students will begin to select courses that are relevant to one or more of the following areas of specialization:

**Area I: Theories of Race and Power**

**Area II: Cultural Politics and Production**

**Area III: The State, Law, and Social Transformation**

Students are also encouraged to supplement regular curricular offerings by initiating individual or small-group reading courses with appropriate Ethnic Studies faculty (ETST 290's etc.) or with cooperating faculty in other CHASS departments.

First-year core requirements:

ETST 200 (Fall) History of Ideas in Ethnic Studies

ETST 201 (Winter) Contemporary Theories in Ethnic Studies

ETST203 (Spring) Methodologies in Ethnic Studies

ETST 289 (Fall, Winter, Spring) Departmental Colloquium

Second-year core requirements:

ETST 289 (Fall, Winter, Spring) Departmental Colloquium

ETST 405 (Fall) Graduate Proseminar on Professionalism

**Research and Teaching Requirements** A student's program must include at least one academic quarter of supervised research through enrollment in ETST 297 and/or by working as a research assistant. The equivalent of at least one academic quarter of college classroom teaching is also required of all students.

**Grades** A student must complete courses in the core curriculum and the specialization areas with a grade of "B" or better in each course.

**Ph.D. Written and Oral Qualifying Examinations**

Written Qualifying Examination

Graduate students are required to successfully complete a Written Qualifying Examination by the end of the winter quarter of their second year. The exam will test the student's knowledge of the methodological and theoretical foundations of the field of Ethnic Studies and will cover material from the required core courses as well as courses in the student's area(s) of specialization. This exam is evaluated by a faculty committee. If the student passes this exam, the committee will recommend awarding of the M.A. degree in Ethnic Studies. If the M.A. is awarded, or if the student already has an M.A. in Ethnic Studies, the faculty then votes on whether or not the student should continue in the Ph.D. program.

Oral Qualifying Examination

Students must compose, in consultation with a committee consisting of three to four faculty members, three written field statements that pertain to theoretical, methodological, and substantive foci related to the preparation of their dissertation.

Graduate students are required to successfully complete an Oral Qualifying Examination by the end of the winter quarter of their third year in which the student must display mastery over his/her three fields. If the oral exam is passed, the student will advance to candidacy.

**Dissertation Prospectus** The Ph.D. candidate must also submit, no later than the fall quarter of their fourth year, a written prospectus outlining the topic, thesis, methods, resources, and timeline for the completion of the dissertation. The candidate must hold a Prospectus Meeting with Dissertation Committee members for final approval of the dissertation prospectus.

**Foreign Language Requirement** There is no formal language requirement. However, in certain research areas a language requirement may be required if it is deemed that the language is germane to the student's research. In those cases where foreign language is required, com-

petency can be established either by presenting evidence of satisfactory completion of the UCR Language Placement Exam, or by means of a translation test administered by the Graduate Affairs Committee.

**Dissertation and Presentation** Doctoral students who have advanced to candidacy will research and write a dissertation under the guidance of a Dissertation Committee. The dissertation should focus on a specific aspect of the candidate's fields of study, and must conform to the format prescribed by the Graduate Council. After the Dissertation Committee approves the completed dissertation, the candidate must formally present his/her dissertation as part of the Departmental Colloquium series.

**Normative time to degree:** The normative time for completion of the Ph.D. degree is six years.

## Lower-Division Courses

**ETST 001. Introduction to the Study of Race and Ethnicity (4)** Lecture, 3 hours; discussion, 1 hour.

ETST 001 will introduce students to major concepts and controversial issues in the study of race and ethnicity and shall provide a general overview of topics to be covered in more specialized Ethnic Studies courses. Credit is awarded for only one of ETST 001 or ETST 001H. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 001H. Honors Introduction to the Study of Race and Ethnicity (4)** Lecture, 3 hours; discussion, 1 hour.

Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ETST 001. Introduces students to major concepts and controversial issues in the study of race and ethnicity. Provides a general overview of topics covered in more specialized Ethnic Studies courses as well as an introduction to the methodology of scholarly research. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ETST 001 or ETST 001H. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 002. Introduction to Chicano Studies in Comparative Perspective (4)** Lecture, 3 hours; discussion, 1 hour.

Provides an overview of the Chicano experience from 1848 to the present, comparing and contrasting with the experiences of the dominant society and those of other racial and ethnic groups. Credit is awarded for only one of ETST 002 or ETST 002H. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 002H. Honors Introduction to Chicano Studies in Comparative Perspective (4)** Lecture, 3 hours; discussion, 1 hour.

Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ETST 002. Provides an overview of the Chicano experience from 1848 to the present, comparing and contrasting with the experiences of the dominant society and those of other racial and ethnic groups. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ETST 002 or ETST 002H. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 003. Introduction to African American Studies in Comparative Perspective (4)** Lecture, 3 hours; discussion, 1 hour.

This course is designed to provide an overview of the African American experience in the

United States from antiquity to the present. It employs comparative and interdisciplinary perspectives. Emphasis is placed on examining the African American experience in a world context and comparing the African American experience to the experiences of other racial and ethnic groups. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 004. Introduction to Chicano History (4)** Lecture, 3 hours; extra reading, 3 hours. The historical heritage of the Chicano from Spanish and Indian origins to the Chicano movement, with an emphasis on the period since 1845. Cross-listed with HIST 004. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 005. Introduction to Asian American Studies in Comparative Perspective (4)** Lecture, 3 hours; discussion, 1 hour. This course provides an overview of the Asian experience in the United States from the mid-nineteenth century immigration to Hawaii and the U.S. Pacific coast to the present. The Asian experience is compared and contrasted with that of African Americans and Chicanos/Latinos. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 005H. Honors Introduction to Asian American Studies in Comparative Perspective (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ETST 005. Introduces students to major concepts and controversial issues in Asian American Studies. Provides a general overview of topics covered in more specialized Ethnic Studies courses as well as an introduction to the methodology of scholarly research. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ETST 005 or ETST 005H. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 007. Introduction to Native American Studies in Comparative Perspective (4)** Lecture, 3 hours; discussion, 1 hour. This course provides an overview of the Native American experience in the United States from antiquity to the present. The Native American experience is compared and contrasted with the experiences of the dominant society and those of other racial and ethnic groups. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 007H. Honors Introduction to Native American Studies in Comparative Perspective (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ETST 007. Provides an overview of the Native American experience in the United States from antiquity to the present. Compares and contrasts the Native American experience with the experiences of the dominant society and those of other racial and ethnic groups. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ETST 007 or ETST 007H. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 008. Introduction to Chicano Cultural Studies (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. Identifies the cultural process of the Chicano experience, beginning with the Chicano Movement, and discusses the ideas, beliefs, values, and the forms of consciousness that shaped this process. Introduces literary and cultural works such as essay,

film, theatre, music, poetry, and art. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 012. Religious Myths and Rituals (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; and images of transcendence. Examines religious beliefs and expressions from diverse cultural perspectives. Utilizes materials from indigenous Native (North and South) American, African American, and/or Asian American religions. Cross-listed with RLST 012. Credit is awarded for only one of ETST 012/RLST 012, ETST 012H/RLST 012H, ETST 012W/RLST 012W, or ETST 012X/RLST 012X. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 012H. Honors Religious Myths and Rituals (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ETST 012/RLST 012. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; images of transcendence; and understanding religious beliefs and expressions from diverse cultural perspectives. Utilizes source materials from indigenous Native (North and South) American, African American, and/or Asian American religions. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with RLST 012H. Credit is awarded for only one of ETST 012/RLST 012, ETST 012H/RLST 012H, ETST 012W/RLST 012W, or ETST 012X/RLST 012X. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 012W. Religious Myths and Rituals (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): a grade of "C" or better in ENGL 001B or consent of instructor. A writing-intensive introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; and images of transcendence. Examines religious beliefs and expressions from diverse cultural perspectives. Utilizes materials from indigenous Native (North and South) American, African American, and/or Asian American religions. This course fulfills the third quarter writing requirement for students who earn a grade of "C" or better. Cross-listed with RLST 012W. Credit is awarded for only one of ETST 012/RLST 012, ETST 012H/RLST 012H, ETST 012W/RLST 012W, or ETST 012X/RLST 012X. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 012X. Religious Myths and Rituals (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program, a grade of "C" or better in ENGL 001B; or consent of instructor. Honors course corresponding to ETST 012W/RLST 012W. A writing-intensive introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; images of transcendence; and understanding religious beliefs and expressions from diverse cultural perspectives. Utilizes materials from indigenous Native (North and South) American, African American, and/or Asian American religions. This course fulfills the third quarter writing requirement for students who earn a grade of "C" or better. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with RLST 012X. Credit is awarded for only one of ETST 012/RLST 012, ETST 012H/RLST 012H, ETST 012W/RLST 012W, or ETST 012X/RLST 012X. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 014. Popular Musics of the World (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to issues surrounding popular and urban musics of the world, focusing on three major geocultural areas: Africa, Asia, and the Americas. Emphasizes the relationship between mass-mediated music and issues of cultural hegemony, resistance, and subversion. Analyzes the cultural impact of media technology on music performance and reception. Cross-listed with MUS 014 and URST 014. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 061. Martin Luther King, Jr (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001, HIST 060, or consent of instructor. A study of the life of Martin Luther King, Jr. with emphasis on the civil rights campaigns he led in the period, 1955-1968 and on the social and political philosophies he taught and espoused. Cross-listed with HIST 061. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 091. Freshman Research Seminar (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): freshman standing or consent of instructor. A focused research seminar designed uniquely each time it is taught. Instructors emphasize their field and area of research. Students work in small groups. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

## Upper-Division Courses

**ETST 100. Race and Ethnicity in a Comparative Perspective (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001. Explores the interrelationships between race, class, ethnicity, and the operation of social processes. Accordingly, readings for this course center on the comparative well-being of African Americans, Hispanics (especially Chicanos), Native Americans, and Asian Americans. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 101A. Historical Development of Race, Racism, and White Supremacy (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 001 or ETST 001H; two additional lower-division Ethnic Studies courses; upper-division standing or consent of instructor. First of a two-course interdisciplinary sequence on theories of race and ethnicity. Focus is on a critical historical charting of the political, economic, and cultural development of race, racism, and white supremacy. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 101B. Theories of Race and Resistance (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 101A or consent of instructor. Second of a two-course interdisciplinary sequence on theories of race and ethnicity. Focus is on specific theories of race, dominance and resistance, recognizing the central structuring debates about social formation and social change. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 102. The Political Economy of Race and Class (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. This course explores the interrelationships among race, class, ethnicity, and the operation of market processes. Readings for this course will center on the comparative economic well-being of African Americans, Chicanos, Asian Americans, and Native Americans. *Fulfills the Social Sciences requirement*

for the College of Humanities, Arts, and Social Sciences.

**ETST 104. Introduction to African Civilization (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to African studies from an interdisciplinary perspective. Describes the dynamics of African society. Examines the Black diaspora's interaction with and influence upon the political and historical developments on the continent of Africa. Evaluates, when relevant, the impact of the non-African upon the African. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 105A. History of Black Americans: West African Backgrounds to 1877 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The study of the experiences of Black people in the United States with emphasis on the ideas and institutions that have shaped those experiences from the period of slave trading in West Africa to 1877. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 105B. History of Black Americans: 1877-1965 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the experiences of Black people in the United States with emphasis on the ideas and institutions that have shaped those experiences from 1877 to 1965. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 106. Theory in Asian American Studies (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines major themes that influenced current theory in Asian American studies: the racist nature of political and legal institutions, labor markets, the popular culture; contemporary feminist theory and politics; criticism of the assimilation paradigm which predicted eventual political and economic integration into mainstream American life. Explores how Asian American communities were viewed as sites for political mobilization, the building of alternative institutions, and the creation of an oppositional culture. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 107. Blacks in America: Assimilation versus Separation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analytical survey of the themes of assimilation and separatism in the history of Blacks in the United States. Involves lecture, discussion, readings, and audio-visual presentations. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 108 (E-Z). Special Topics in Chicano Studies (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Selected topics in: E. Culture, Ethnicity, and Social Change; F. The Conditions of Education for Chicanos; I. Mexican Immigration and the Chicano Community; L. The Labor and Legal History of the Chicano; P. Chicano Poetry and Theatre. *E, F, and I fulfill the Social Sciences requirement; L fulfills the Humanities or Social Sciences requirement, but not both; and P fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 109 (E-Z). Special Topics in African American Studies (1-4)**

Lecture, 1-3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003, upper-division standing; or consent of instructor. Selected topics addressing the issues of the African American experi-

ence. Reading, research, and discussion on the African American experience. *See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.*

**ETST 109E. African Americans in the U.S. Economy (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003, upper-division standing; or consent of instructor. Explores the role of African Americans in the U.S. political economy. Examines the interaction of class, race, the state, and social institutions determining the economic life chances of Americans of African descent. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 109F. The Political Economy of the African American Economy (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003, upper-division standing; or consent of instructor. Examines the transformations in the structure of African American families and households in a society bifurcated by wealth and power. Focuses on the interaction among class, ethnicity, the state, social institutions, and market processes in the formation and structural stability of alternative African American families and households. *Fulfills the Humanities or Social Sciences requirement, but not both, for the College of Humanities, Arts, and Social Sciences.*

**ETST 109G. Caribbean America: Transplanted West Indians and the Black Immigrant Experience (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003, upper-division standing; or consent of instructor. Examines the growth and evolution of the transplanted West Indian community in America. Attention is paid to the immigration process, community formation, political participation, economic consolidation, and intellectual and cultural contributions to African America. Explores the varied assortment of readings on the Caribbean American experience and the historiography and methodology of African American history. *Fulfills either the Humanities or Social Sciences requirement, but not both, for the College of Humanities, Arts, and Social Sciences.*

**ETST 109-I. The Black Diaspora: Cultural, Political, and Historical Connections (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003, upper-division standing; or consent of instructor. Examines the dispersal and evolution of transplanted African populations throughout the world. Emphasis is on the most recent diaspora between 1600 and 1890 when millions of Africans migrated to the Western Hemisphere. The smaller African communities in Asia, Europe, and the Pacific Islands are also examined. *Fulfills either the Humanities or Social Sciences requirement, but not both, for the College of Humanities, Arts, and Social Sciences.*

**ETST 110 (E-Z). Special Topics in Asian American Studies (1-4)**

Lecture, 1-3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Selected topics addressing the issues of the Asian American experience. Reading, research, and discussion on the Asian American experience. G. Community Research: Asian American Community; K. Foreign Policy and Asian Americans. *G and K fulfill the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 111. Ethnic Politics: Practicum in Political Change (4)**

Lecture, 3 hours; practicum, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Studies theories and practices of comparative ethnic political change. Examines topics intrinsic to the understanding of how to effect political change within the Chicano, African American, Asian American, Native American, and other ethnic communities, as well as the dominant societies. *Fulfills the*

*Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 112. The Civil Rights Movement, 1950-1970 (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The Civil Rights Movement of the 1950s and 1960s. The main focus will be on the "grass roots." African American aspects of "The Movement," as it was popularly known, from school desegregation to voting rights and beyond. Cross-listed with HISA 135. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 113. African American Women (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers the writings and collective organizational strategies of African American women intellectuals and activists developed in response to the ways racial, sexual, and economic oppression work interdependently and are institutionalized. Beginning with early women's slave narratives, follows black women's agendas for social change to the present. Cross-listed with HISA 134. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 114. Contemporary Latina Writing in the U.S (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical readings of Chicana, Puerto Rican, and Cuban American authors. Overview of contemporary literature (1970 to present) written by Latinas who reside permanently in the United States. Theatre, poetry, and narrative is closely examined and compared. Focuses on the political, historical, social, and cultural processes that give rise to this literature. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 115 (E-Z). Topics in Native American History (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Selected topics addressing the issues of the Native American. Includes reading, research, and discussion on the Native American experience. F. Early America: Emerging Interpretations. Cross-listed with HISA 144 (E-Z). *Segments fulfill the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 116. Medicine Ways of Native Americans (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the medical history of Native Americans. Focuses on traditional Native American medicine and how Western diseases, medical practices, health care, and policies influenced American Indian health. Topics include medicine people, rituals, ceremonies, smallpox, measles, influenza, anomie, accidents, diabetes, suicides, mental illness, and murders. Cross-listed with HISA 147. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 117 (E-Z). Themes and Topics in African History (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A thematic and topical approach to the study of African history from the early Nile Valley civilizations to the twentieth century. Examines the temporal and spatial development of African societies—including their social, political, economic, and ideological systems—during the precolonial, colonial, and postcolonial periods. F. West African History to 1800; I. Nineteenth- and Twentieth-Century Africa and European Imperialism; J. Ancient Africa; K. Africa from 1000-1880; M. Twentieth-Century Africa. Cross-listed with HIST 137 (E-Z). *See the Student Affairs*

Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.

**ETST 118. Music Cultures of Africa (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of African performance, addressing the large culture areas of the continent. Emphasizes African aesthetics. Special attention is paid to contemporary popular music, its roots in older genres, and its ongoing role in postcolonial politics. Cross-listed with MUS 129. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 119. The Black Indian Experience: African Americans and Native Americans (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates growth and evolution of the relationship between African Americans and Native Americans. Focuses on selected Native American nations and their relationship with transplanted Africans, blended communities of blacks and Indians, the process of transculturalization, black Indians as outlaws, and blacks and Indians in a modern educational experiment. *Fulfills the Social Science requirement of the College of Humanities, Arts, and Social Sciences.*

**ETST 120. Contemporary Native American Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of representative works of fiction, nonfiction, and poetry from the 1960s to the present. Emphasis upon the works of Louise Erdrich, Joy Harjo, N. Scott Momaday, Simon Ortiz, Leslie Silko, Gerald Vizenor, and James Welch, among others. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 121. Street Gangs in Comparative Perspective (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the emergence and development of street gangs as a historical and contemporary phenomenon. Special emphasis is given to alternative conceptions, definitions, and theories of gang formation. The approach is comparative, focusing on African American, Asian American, Chicano, and White street gangs. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 122. Family, Sex Roles, and the Chicano (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A systematic analysis of Chicano family and sex roles, with special emphasis on the functions of the Chicano family in contemporary society. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 123. Chicano Politics in Comparative Perspective (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of contemporary Chicano politics, political movements, ideologies, relations with intergovernmental agencies, political attitudes, and participation in the political process. Comparison of the Chicano political experience to that of other racial and ethnic groups in American politics. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 124. The Chicana (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The unique experience of the Chicana viewed from social, intellectual, historical, and artistic perspectives. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 125. Chicano Political History: Nineteenth and Twentieth Centuries (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 002 or ETST 002H or ETST 004/HIST 004; upper-division standing. Surveys the history of Chicano politics in the United States from Mexican independence in 1821 to the present. Assesses the continuity of the Chicano political tradition through a comparison of the Chicano political experience before and after the establishment of American sovereignty. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 126. The Chicano and the Law (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the relationship of the Chicano to the U.S. legal and judicial system. Topics include traditional sociological and criminological theories, history of the Chicano and the law, the Pachuco image and the Chicano, and the police and correctional institutions. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 127. Latino Men and Masculinity (5)** Lecture, 3 hours; term paper, 3 hours; written work, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or consent of instructor. Analysis of Chicano/Latino men and masculinity in historical and comparative perspective. Examines social construction and expression of manhood and masculinity in a cross-national context and the range and varieties of masculinities in Latino America. Critically evaluates and deconstructs common myths, stereotypes, and misconceptions about men, machismo, and masculinity. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 128. Chicano Sociology (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the experience of Mexicans in U.S. society; history as a minority; mass immigration in the twentieth century, relationships with American institutions, present socioeconomic status, variations in social status from region to region, political emergence and variations in values, social relations and integration with non-Mexicans. Cross-listed with SOC 128. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 129. Theories in Chicano Studies (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001 or ETST 001H; ETST 002 or ETST 002H; ETST 004/HIST 004; upper-division standing or consent of instructor. Analyzes prevailing and emerging theories, paradigms, and perspectives in Chicano Studies. Examines and applies traditional social science theories of race and ethnicity such as the order/pluralistic, assimilationist, and functionalist models, as well as Marxism, internal colonialism, feminism, postmodernism, and critical race theory to the experiences of Chicanos and other Latinos. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 130. History of Public Education in Communities of Color (4)** Seminar, 3 hours; term paper, 1 hour; outside research, 2 hours. Prerequisite(s): upper-division standing; consent of instructor. An introduction to a comparative analysis of public education as it relates to Native Americans, African Americans, Latinas/os, Chicanas/os, and Asian Americans. Focuses on experiences within the United States. Compares and contrasts experiences within these groups, as well as identifies major policy disagreements. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 131. Race, Class, and Gender (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Compares and contrasts race, class, and gender in relation to social inequality and oppression. Focuses on the intersection of all three components, as well as examines the experiences of poor and working-class women of color. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 132. Chicano Contemporary Issues (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides students with demographic and historical overview of the status of Latinos in the United States today, and of the salient issues plaguing them. Utilizing an interdisciplinary approach, analyzes strategies, tactics, and policies that may effectively deal with these issues. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 133. Asian Diaspora: Historical, Contemporary, and Comparative Perspectives (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the dispersal, transplantation, and transformation of Asian populations in selected regions of the world—the Americas, Europe, the Middle East, and Asia Pacific—as viewed from the historical and contemporary experiences of the Chinese, Japanese, Filipinos, Koreans, Vietnamese, and other Asian groups in the contexts of colonization, cultural and political domination, and an emerging global economy. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 134. Asian American History (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Overview of the Asian American experience in the United States before World War II. Describes how the racialization of Asians as “non-White” and nonassimilable shaped the experiences of Chinese, Japanese, Koreans, Filipinos, and South Asians in America. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 135. The Mass Incarceration of Japanese Americans (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Overview of mass incarceration of Japanese Americans within their overall experience in the United States. Emphasis is on variables that generated similarities and internal diversity within the broader ethnic group. Also explores the broad relevance of mass incarceration for understanding our post-9/11 world. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 136. The Korean American Experience (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the history of Koreans in the United States to analyze a wide range of contemporary social and identity issues. Students are encouraged to do original research, develop writing and communication skills, and devise research projects that address the immigrant Korean community's needs. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 137. The Vietnamese Americans: The Refugee and Immigrant Experience (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. This course will focus on the Vietnamese American experience in contemporary society. Special emphasis will be placed on

the relationship of Vietnamese Americans to the larger society and on intergenerational strains and conflicts. Among the topics addressed are: 1) socioeconomic and educational problems; 2) the family; 3) religion; and 4) the relationship between Vietnamese Americans and other racial ethnic groups (African Americans, Native Americans, Anglos, and Chicanos). *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 138. Asian American Literature: A Historical Survey (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the historical development of Asian American literature. Special emphasis placed on the origin and growth of Asian American novels, autobiographies, poetry, short stories, and plays that focus on socioeconomic and political struggles of Asian American communities. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 139. Contemporary Issues in the Asian American Community (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes contemporary issues facing Asian Americans: Asian American identity and images, education, employment, housing, dual oppression, interethnic conflicts, juvenile delinquency, generational conflicts, and anti-Asian violence. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 140. Asian American Women (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Addresses the shifting role of Asian American women in the United States as they struggle to define their identities between and within diverse and often opposing cultures. The myths and realities of being an Asian American woman are explored and analyzed through literature, art, documents, films, and first-person accounts. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 141A. A Survey of Black Literature: The Folk Period (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the significant Black American writers and literary movements in the nineteenth and early twentieth centuries (the folk period of Black literature). Attention is on slave narratives, protest literature, and the Harlem Renaissance. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 141B. A Survey of Black Literature: 1930 to the Present (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 141A. A survey of the significant Black American writers and literary movements from 1930 to the present. Attention will focus on the work of literary movements represented by such writers as Wright, Ellison, Brooks, Baldwin, Baraka, and others. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 142. Organizations, Institutions, and the Chicano (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The study of organizations and institutions, focusing on their effect on the Chicano. Special emphasis will be placed on the processes of participation within institutions and of dealing with complex organizations. Concepts to be studied include conflict, role identity, and socialization. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 143A. Critical Filipino(a) Studies: Histories and Legacies of U.S. Conquest, Colonialism, and Empire (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critically examines and theorizes the historical impact and legacies of U.S. conquest and colonialism in the Philippines. Analyzes the origins of Filipino American civic existence and its links to histories of U.S. racial formation, racialized industrialization, and racialized frontier warfare. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 143B. Critical Filipino(a) Studies: Interrogating the Filipino American Present (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 143A; upper-division standing or consent of instructor. Critically analyzes the emergence of Filipino American community and identity discourses in relation to the U.S. emancipation of the Philippines and the complex restructuring of a neocolonial and imperial relation. Examines the theoretical and conceptual premises of Filipino Americanism through counterhegemonic social movements, cultural production, and identity formation. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 144. Race and Ethnicity in Hawaii (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ETST 001 or ETST 005. A comparative and historical survey of the racial dynamics of Hawaii's multicultural community and the intersections between Hawaii's ethnic groups: the native Hawaiians, the white ("haole") population, and the plantation immigrant groups, especially the Chinese, Japanese, Filipinos, and Portuguese. Includes a discussion of the Pacific Islander population in contemporary Hawaii. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 145. Law and Subordination (5)** Lecture, 3 hours; field, 6 hours. Prerequisite(s): upper-division standing in Ethnic Studies or Sociology; ETST 128/SOC 128. A comparative and historical analysis of subordinated communities and law with special emphasis on integrating theoretical understanding of racial, class, and gender subordination. Field experience working directly with groups that have traditionally lacked equal access to the legal and judicial system. Cross-listed with SOC 145. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 146. Educational Perspectives on the Chicano (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): consent of instructor. An examination of educational policy issues concerning Chicano students, such as testing and testing procedures, learning styles, socialization, and language acquisition. Other topics will deal with the impact of significant legislative acts related to the education of Chicanos. Cross-listed with EDUC 146. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 147. History of Black Education (4)** Lecture, 3 hours; individual study, 4 hours. Prerequisite(s): upper-division standing. This course examines major themes in Black education: the education of slave and free Blacks; role of missionaries and philanthropists in Black education; the growth of Black colleges; curricular debates; and the NAACP challenge of the "separate but equal" doctrine. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 148. Caribbean Culture and Society (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of the Caribbean region from a historical,

cultural, and political perspective. Emphasis on contemporary issues affecting the Caribbean, and the struggle of its people to maintain their identities. Cross-listed with ANTH 168 and LNST 168. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 149. Street Scholars: Struggles and Contributions of Self-Trained Black Historians and Stepladder Radicals (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the growth and evolution of self-trained African American intellectuals and activists from the late nineteenth century to the 1980s. Analyzes ideas, contributions, and worldviews of selected street scholars pertaining to the destiny and direction of race struggle in America, the Caribbean, and Africa. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 150. Asian American Family and Culture (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 005 or consent of instructor. Examines the influence of cultural legacy, ethnic background, immigration history, community structure, racism, class, and economic status on the sociological and psychological dynamics of the Asian American family and personality. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 151. Contemporary Asian American Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of contemporary Asian American literature and culture. Explores identity politics, cultural nationalism, feminism, sexuality, postmodernism, postcolonialism, diaspora, and transnationalism. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 152. Asian American Film and Video (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): ETST 001 or ETST 001H, upper-division standing; or consent of instructor. Survey and analysis of cinematic works by and/or about Asian Americans. Topics include studies of forms and genres; viewing and interpretive practices; the conditions of production, distribution, and reception; as well as thematic concerns such as history and memory, the politics of identity, community, social justice, gender, and sexuality. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 153. Contemporary Latin American and Chicano Novels (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Reading, in-depth analysis, and discussion of contemporary Latin American novels in translation and Chicano novels, based on a consideration of their salient, formal, and thematic concerns. Cross-listed with LNST 153. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 154. Chicanos and Popular Music in the Twentieth Century: From Pachuco Boogie to Latin Jazz (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examination of musical styles and expressive cultures of everyday Mexican Americans in primarily Southern California to understand their social consciousness and cultural politics. Covers the historical evolution of diverse Chicano cultural identities, musical tastes, and communities. Focuses on cultural hybridity, subcultural style, identity formation, class mobility, gender, sexuality, racialization, and assimilation. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 155. Chicana/o California: A Social and Cultural History (4)** Lecture, 3 hours; extra reading, 3 hours.

Prerequisite(s): upper-division standing or consent of instructor. Examination of the historical evolution of Mexican and Mexican American social and cultural experience in California from the Spanish colonial period through the late twentieth century. Analysis of the Chicana/o impact on regional culture and American society as a whole. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 156. Politics of the Chicano Movement (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the various aspects of the politics of the Chicano movement from 1965 to 1974. Focuses on in-depth analysis of the movement's historical genesis, leadership, ideology, organizations, strategy, and tactics, as well as the issues that brought it into being. Also examines the forces that contributed to its demise. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 157. Native American Diaspora (4)** Lecture, 3

hours; term paper, 3 hours. Prerequisite(s): ETST 007, upper-division standing; or consent of instructor. Analyzes historical Native American migrations. Explores involuntary Native American diaspora throughout America forced by interaction with Spanish, French, Dutch, and English colonists. Examines nineteenth- and twentieth-century reservations and forced and voluntary removals and relocations. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 158. Roots of American Indian Tradition (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes selected spiritual beliefs of America's native peoples. Examines sacred beliefs, oral histories, ceremonies, customs, and the historical significance of selected tribes and bands. Explores the conditions and forces which shaped American Indians and influence them today. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 159. Texas Indian History (4)** Lecture, 3 hours;

term paper, 3 hours. Prerequisite(s): ETST 007 or ETST 007H or HIST 035 or HIST 036 or HIST 037 or consent of instructor. History of the aboriginal peoples of Texas from the earliest times to the present. Examines pre-colonial eras, European invasion, and colonialism under Mexico, the Republic of Texas, and the United States. Discusses the effects of treaties, laws, and federal and state policies on modern Texas Indians. Emphasizes the survival and adaptation of native peoples of Texas. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 160. Community Research and Advocacy (4)**

Seminar, 2 hours; written work, 1 hour; field, 8-10 hours. Prerequisite(s): ETST 145/SOC 145 or consent of instructor. Covers theoretical, practical, and ethical issues associated with community-based research and advocacy. Course is repeatable to a maximum of 8 units. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 161. U.S. Latinos: Crossing Borders, Crossing Cultures (4)** Lecture, 3 hours; term paper, 3 hours.

Prerequisite(s): upper-division standing or consent of instructor. Introduces the idea of Latino identity as a way to study heterogeneity of ethnic group identification. Focuses on historical chronology, literary tradi-

tion, and other cultural practices. Emphasis is on the experience of diversity and pluralism within the Latino experience. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 164. History of African American Education: 1950-Present (4)** Lecture, 3 hours; individual study, 3

hours. Prerequisite(s): ETST 147. Introduces the major themes in African American education. Focuses on litigation in public education, politics, policies in circumventing desegregation, and churches and community organizations advancing desegregated education. Also explores poverty and urban schools, social programs, the Afrocentric pedagogy of failure, separate schools for blacks, resegregation, and the achievement promise. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 166. Issues in Bilingual/Bicultural Education (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): bilingual facility and consent of instructor. An intensive analysis of issues involved in developing and implementing bicultural/bilingual programs for Chicano children. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 167. Psychological Development of Black Children (4)** Lecture, 3 hours; extra reading, 3 hours.

Prerequisite(s): PSYC 002. This course will analyze both the traditional theoretical approaches to the study of Black children and innovative approaches that are currently being developed by Black psychologists. The course will cover topics in the areas of cognitive, social, and personality development. Cross-listed with PSYC 167. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 168. Psychological Aspects of the Black Experience (4)** Lecture, 3 hours; extra reading, 3

hours. Prerequisite(s): PSYC 002. This course examines the interdependence between personal characteristics. African American culture, and the social conditions which foster the Black experience. Group membership, life styles, role factors, and situational settings as social norms will be explored in order to understand the uniqueness of the Black experience. Cross-listed with PSYC 168. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 169. The Politics of Race and Performance (4)** Lecture, 3 hours; extra reading, 3 hours.

Prerequisite(s): upper-division standing or consent of instructor. Considers the complex practice of dance, music, and performance art by expressive artists of color and asks questions about address, audience, white uses of black performance techniques, dance in relation to self-conscious historical memory, and the politics of authenticity and commodification. Investigates performances from different locations, from explicitly politicized to heavily commercialized. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 170. Third World Literature (4)** Lecture, 3 hours;

extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of some major works associated with Third World literature and film. Emphasis on African, Latin American, Caribbean, African American, and Chicano Literature. Cross-listed with WRLT 170. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 171. Rap, Hip-Hop, and Popular Culture (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s):

upper-division standing. Examines the various aspects of the history, purpose, functions, and culture of the rap and hip-hop movement. Topics include the origins of rap in African culture; the Griots; various elements of rap in slave songs, jazz, the blues, poetry, and rhythm and blues; and the evolution of gangsta rap and hip-hop from 1970 to the present. Focuses on the impact rap has had on popular culture and social problems. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 172. Music Cultures of Southeast Asia (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with ANTH 176, AST 127, DNCE 127, and MUS 127. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 173. Black Art in America (4)** Lecture, 3 hours;

field, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Discusses Black artists in the visual arts from slavery until the end of the Negro Renaissance (mid-1930s). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 175. Gender, Ethnicity, and Borders (4)** Lecture, 3

hours; extra reading, 3 hours. Prerequisite(s): ETST 001 or WMST 010 or upper-division standing. Examines literary, theatrical, and visual sites where the "in-between" space of border cultures is mapped. Materials include autobiographies, testimonial literature, films, novels, performance scripts, and art. The interplay of gender and ethnicity is the special focus. Cross-listed with WMST 175. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 176. Geographies of Pain: Black Women, Trauma, and Survival (4)** Lecture, 3 hours; outside research, 3

hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the relationship between gender and violence. Illustrates ways in which crimes such as incest are not just instances of dysfunction within the black family but are also examples of the roles gender and race play in the historical violence of the nation-state. Examines how integral violence is to the creation of blackness and to the necessity to envision practices of survival. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 177. The U.S. Prison Industrial Complex: Race, Gender, and Citizenship (4)** Lecture, 3 hours; extra

reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the racialized and gendered information of U.S. jurisprudence, policing, and punishment practices. Explores the connections between prison expansion, corporate investment in prison and policing technology, exploitation of prison labor, and deployment of prison-building initiatives as pork barrels for elected officials. Also analyzes anti-prison, prison reform, and penal abolitionist discourses. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 178. Imprisoned Radical Intellectuals and U.S. Liberation (4)** Lecture, 3 hours; extra reading, 3

hours. Prerequisite(s): upper-division standing or consent of instructor. Examination of the work of imprisoned writers of color as well as white intellectu-

als/activists who have influenced the formation of social movements in the United States since the 1970s as prisons and jails have become primary sites of political and racial conflict. Elaborates how race, gender, and patriarchy are central to the establishment of state regimes of incarceration. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 179. Understanding Whiteness: Racialization and Identity Formation in American Culture (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of U.S. racialization, identity formation, institutionalized racism, and structural inequality from the early Republic to the present. Examines continuing evolution of a national white racial consciousness; the legal, social, and economic exploitation of people of color; and the transfer of inherited legacies and benefits along racialized power lines. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 180. California Indian History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides students with a broad understanding of the rich and varied heritage and history of California Indians from the invasion of the Spanish to the twentieth century. Examines geographically and culturally diverse groups as a means of illustrating the various Euro-American Indian policies that affected native Californians. Course is comparative and thematic. Cross-listed with HISA 140. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 181. Southwestern Indian History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Presents a historical examination of selected Native American groups in the Southwest. Examines the relationship of Southwestern Indians to the Spanish, Mexican, and United States governments. Focuses on Quechans, Tohono O'odam, Yavapai, Chiracahuas, Navajos, Zunis, Hopis, Comanches, and selected Pueblos along the Rio Grande. Cross-listed with HISA 141. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 182. Northwestern Indian History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected aspects of Northwestern Indian History, from approximately the 1750s to the twentieth century. Deals with several native groups along the Northwest coast from Alaska to Oregon. Compares policies of the Russian, Spanish, English, and United States governments. Particular emphasis on the 1850s when the U.S. negotiated a number of treaties with Native Americans in the Washington and Oregon territories. Cross-listed with HISA 142. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 183. Native American Oral Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 007; upper-division standing or consent of instructor. Comparative examination of Native American oral literature of tribes in the United States, Canada, and Mexico. Enhances the student's understanding of Native American language, literature, drama, geography, geology, biology, history, and culture. Cross-listed with HISA 143. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 184. American Indian Policy in the Twentieth Century (4)** Lecture, 3 hours; consultation, 1 hour.

Prerequisite(s): upper-division standing or consent of instructor. This course will begin with the end of the treaty-making period and the point in time that the United States emerged as a colonial power (1871). The history of the relationship between the United States government and the American Indian tribes from the year 1871 to 1988 will be presented phase by phase. In addition, it will explore the position and role of the American Indian during the last twenty years. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 185. Native American Law (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Emphasis on traditional law, civil and criminal rights, water rights, First Amendment religious freedom, and gaming on reservations. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 186. Policing and the Hegemony of "Law and Order": Race, Gender, Sexuality, Citizenship, and the Politics of Criminalization (4)** Lecture, 3 hours; class project, 3 hours. Prerequisite(s): ETST 001. Provides a critical approach to the interdisciplinary study of state violence and militarized policing. Examines ways in which policing technologies and tactics are organized through racialized, gendered, and classed hierarchies. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 187. The Social and Political Thought of Frantz Fanon (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the recent emergence of "Fanon Studies," an interdisciplinary subfield focused on the political-intellectual work of Frantz Fanon and related intellectuals. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 188. Native American Women (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Native American gender systems and the changing roles of women. Examines the cultural productions of indigenous women that make important interventions in our understanding of gender and social justice in contemporary Native America. Materials include testimonial literature, autobiographies, films, novels, and popular culture. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 189. Popular Culture and the Production of Race (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): ETST 001 or ETST 001H, ETST 100; or consent of instructor. Offers an interdisciplinary and theoretical approach to the study of various popular film and television genres in relation to the production—and contestation—of racial meaning. Concerned with the material significance of film and television as, simultaneously, "entertainment," "pleasure," "mass culture," "(self-)representation," and "cultural resistance or insurgency." *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing and consent of instructor. Independent study and research by qualified undergraduate students under the supervision of a particular faculty member. Course is repeatable to a maximum of 16 units.

**ETST 191 (E-Z). Seminar in Ethnic Studies (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): for ETST 191E, ETST 191G, ETST 191K, ETST 191R: consent of instructor; for ETST 191F: ETST 001 or

ETST 001H, ETST 005 or ETST 005H; for ETST 191N: ETST 002 or ETST 002H or ETST 008; for ETST 191S: upper-division standing or consent of instructor. Selected topics in the ethnohistories and cultures of African American, Asian American, Chicano/Latino, and Native American ethnic groups. E. Native American History and Research; F. Asian American Studies; G. Chicano Psychology; K. Chicano Sociology; N. Chicano Literature: A Comparative Approach; R. Research Methodology; S. Black Aesthetics. *E, G, and K fulfill the Social Sciences requirement, F, N, and S fulfill the Humanities requirement, and R fulfills no requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 192H. Junior Honors Seminar (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): junior standing or consent of instructor. Advanced research in various fields of faculty interest and expertise. Students are required to complete a research paper utilizing primary and secondary documents and other sources. Seminar focus varies from year to year. Course is repeatable to a maximum of 12 units. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 193. Senior Research Seminar (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): senior standing or consent of instructor. Advanced research in various fields of faculty interest. Students are required to complete a research paper and present their results in the seminar. Topics vary from year to year. Course is repeatable to a maximum of 8 units. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**ETST 198G. Group Internship (1-12)** Internship, 2-24 hours; outside research, 1-12 hours. Prerequisite(s): upper-division standing; consent of instructor. On- or off-campus internship related to the interests of core ethnic-group students under the joint direction of an on- or off-campus supervisor and an Ethnic Studies faculty member. Course is repeatable to a maximum of 16 units. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**ETST 198-I. Individual Internship (1-12)** Internship, 2-24 hours; outside research, 1-12 hours. Prerequisite(s): upper-division standing; consent of instructor. On- or off-campus internship related to the ethnic community, conducted under the joint direction of an on- or off-campus supervisor and an Ethnic Studies faculty member. Requires a report based on the experience. Course is repeatable to a maximum of 16 units. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

## Graduate Courses

**ETST 200. History of Ideas in Ethnic Studies (4)** Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the foundational ideas critical for understanding the historical evolution of race and ethnic issues in the United States and within international relations. Prepares graduate students to conceptualize multidisciplinary and comparative ethnic studies research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 201. Sociocultural Theories in Ethnic Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Examines theoretical

approaches to the study of race and ethnicity in the United States. Assesses the relative strengths and weaknesses of key theoretical paradigms. Perspectives may include symbolic interaction, phenomenology, class analysis, sovereignty, literary criticism, feminism, psychoanalysis, racial formation, critical race theory, postmodernism, and global or transnational. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 203. Research Methods in Ethnic Studies (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Examines some of the foundational theories and methods employed in the field of ethnic studies. Provides basic knowledge in designing and implementing a research project utilizing multiple methods.

**ETST 221. Race, Gender, Law, and Equal Protection (4)**

Seminar, 3 hours; field, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Examines the interrelationships among law, race, gender, equal protection doctrine, and the state. Addresses contemporary theoretical challenges to concepts such as critical legal studies, critical race theory, "LatCrit," and feminist jurisprudence. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade.

**ETST 222. Intersectionalities (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the theory of intersectionality in a transnational framework and historical perspective. Addresses problematics of social identity construction and the body. Considers analyses in relation to people of color and issues of race, sex, economic oppression, homophobia, transgender possibilities, ageism, militarization, nationalism, and globalization. Focuses on collective strategies of resistance and revolution. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 223. Chicana/o Expressive Culture: Theory and Practice (4)**

Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Examines Chicana/o cultural studies theories while tracing the history of diverse communities and expressive cultures from Spanish colonial period through the turn of the twenty-first century. Assesses the role of popular culture and academia in Mexican American life. Explores the Chicanas/os' impact upon the development of popular culture and academia in American society. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 224. Race and State Violence (4)**

Seminar, 3 hours; term paper, 2 hours; written work, 1 hour. Prerequisite(s): ETST 201 or consent of instructor. Engages critical social theories of race. Focuses on state-mediated technologies of power and domination. Emphasizes analyses of race, racism, and white supremacy that conceptualize their historical constitution of statecraft and nation-building processes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 225. Imperialism, Colonialism, and Racism: Global Historical Perspectives (4)**

Seminar, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Charts a critical interdisciplinary genealogy of imperialism, colonialism, and racism within the global context of capitalist modernity. Explores the characteristics of imperialism, colonialism, and racism, as well as their relation to each other and to nationalism, decolonization, and globalization. Addresses how these complex articulations have been theorized. May

be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 226. Cultural Politics and Production (4)**

Seminar, 2 hours; screening, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Considers the discursive and expressive cultural forms produced by racialized subjects. Covers a range of literatures, music, dance, song, and performance forms; the works of individuals and collectives; and social movements.

**ETST 227. Anticolonialism and Its Aftermath (4)**

Seminar, 3 hours; term paper, 1 hour; written work, 2 hours. Prerequisite(s): ETST 201 or consent of instructor. Examines anticolonialist political thought in the context of contemporaneous and subsequent critical work in interdisciplinary fields. Engages these thoughts through frameworks of critical race studies, feminist thought, queer studies, postcolonial studies, and cultural studies. Discusses relevance of anticolonialist theorizations and insights to contemporary social and political problems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 228. Race, Law, and Educational Policy (4)**

Lecture, 3 hours; term paper, 1.5 hours; extra reading, 1.5 hours. Prerequisite(s): graduate standing or consent of instructor. Explores how law and race shape educational policies, as well as how educational policies and practices shape race and law. Examines how decisions made at the federal, state, and local levels influence public education opportunities and access. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 243 (E-Z). Special Topics in Ethnic Studies (4)**

Lecture, 3 hours; activity, 3 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): graduate standing; consent of instructor. A critical analysis of current theory and research in special areas of Ethnic Studies. Covers a single topic not addressed in a regular course. Topics vary from quarter to quarter. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topics change to a maximum of 12 units.

**ETST 244. Borders, Borderlands, and Chicana/o Studies (4)**

Seminar, 3 hours; outside research, 3 hours; extra reading, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Examines the borderlands as a site of social and political negotiation over space and within cultural studies. Topics include race, gender, activism, and culture. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**ETST 245. Theories in Chicana/o Studies (4)**

Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the historical development of theoretical paradigms and models in Chicana/o studies. Covers 1960s protest literature, critical race theory, Chicana feminist theory, "LatCrit," and cultural citizenship. Addresses critical evaluation and application of these paradigms in order to understand the experiences of Chicanas/os and other subordinated communities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 246. Chicano Historiography: Identity, Politics, and the Writing of Chicana/o History (4)**

Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Surveys approaches and genres in the field of Chicano history from classic works to "cutting edge" topics. Analyzes methods employed, as well as theoretical underpinnings. May be taken Satisfactory (S) or

No Credit (NC) with consent of instructor and graduate advisor.

**ETST 247. Policy and Politics: Grass Roots versus Coercive State (4)**

Seminar, 3 hours; discussion, 1 hour; written work, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Provides a current examination of the status of Chicana(o)/Latina(o) politics from both a grass roots and coercive state perspective. Examines divergent theoretical approaches within the contexts of liberal capitalism, pluralist versus elite theory, and identity politics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 248. Race and Critical Educational Policy (4)**

Seminar, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Examines a set of diverse, discipline-based conceptual perspectives and analytic frameworks used to interpret policy purposes, processes, contents, and outcomes. Focuses on the political dimensions of education policy issues. Also explores the conceptual frameworks and skills required in studying politics and exercising leadership in organizational settings. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 249. Race and Critical Educational Politics (4)**

Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the political dimensions of education policy issues, processes, and choices pertaining to governmental arrangements, community contexts, and interest group pressure. Provides conceptual frameworks and perspectives that examine political decision making. Utilizes case studies of educational policy making in educational institutions at the local and state levels. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ETST 255. Critical Issues in Asian American Studies (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Examines and seeks to develop a critical appreciation of research literature on Asians in America and to develop alternative interpretations of the Asian American experience. Topics include Asian American history, economic, political, social, and psychological issues.

**ETST 256. Critical Issues in Asian Pacific American Communities (4)**

Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): graduate standing. Examines contemporary issues facing Asian Pacific American communities. Students engage in active research in these communities.

**ETST 289. Colloquium in Ethnic Studies (1)**

Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Lectures and discussions by students, faculty, and invited scholars on selected topics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

**ETST 290. Directed Studies (1-6)**

scheduled research, 3-18 hours. Prerequisite(s): graduate status and consent of instructor. Research and special studies in Ethnic Studies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ETST 291. Individual Study in Coordinated Areas (1-12)**

Individual study, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. A program of study designed to advise and assist candidates who are preparing for doctoral examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 24 units.

**ETST 292. Concurrent Analytical Studies in Ethnic Studies (1-4)**

Individual study, 3-12 hours.

Prerequisite(s): consent of instructor. Taken concurrently with a 100-series course in Ethnic Studies, but on an individual basis. Devoted to completion of a graduate-level paper based on research or criticism related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

#### ETST 293. Research Topics in Ethnic Studies (2)

Seminar, 3 hours. Prerequisite(s): graduate standing; consent of instructor. A series of seminars by guests, faculty, and advanced graduate students that addresses research topics in ethnic studies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**ETST 297. Directed Research (1-2)** Outside research, 3-6 hours. Prerequisite(s): graduate standing; consent of instructor. Individualized research in topics outside the dissertation area. Conducted under the sponsorship of specific faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ETST 299. Research for the Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): satisfactory completion of the Ph.D. qualifying examination. Faculty-directed research for preparation of the dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**ETST 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): limited to teaching assistants; graduate standing. Supervised teaching in lower- and upper-division courses. Required of all Ethnic Studies teaching assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

#### ETST 405. Proseminar on Professionalization (2)

Seminar, 27 hours per quarter; practicum, 3 hours per quarter. Prerequisite(s): graduate standing; consent of instructor. Covers a broad range of topics related to academic professionalization. Addresses issues pertaining to the dissertation, publishing, professional activity, and the process of getting tenure. Also covers issues related to teaching at the university level. Graded Satisfactory (S) or No Credit (NC).

## Evolution, Ecology, and Organismal Biology

See [Biology \(Graduate Program\)](#)

## Genetics, Genomics, and Bioinformatics

Subject abbreviation: **GEN**

College of Natural and Agricultural Sciences

TBA, Director  
Program Office, 1140 Batchelor Hall  
(800) 735-0717 or (951) 827-5688  
[www.ggb.ucr.edu](http://www.ggb.ucr.edu)

### Professors

Peter W. Atkinson, Ph.D. (Entomology)  
Julia N. Bailey-Serres, Ph.D. (Botany and Plant Sciences)  
Nancy E. Beckage, Ph.D. (Entomology/Cell Biology and Neuroscience)  
Katherine A. Borkovich, Ph.D. (Plant Pathology)  
James Borneman, Ph.D. (Plant Pathology)  
Xuemei Chen, Ph.D. (Botany and Plant Sciences)  
Timothy J. Close, Ph.D. (Botany and Plant Sciences)  
Donald A. Cooksey, Ph.D. (Plant Pathology)  
David E. Crowley, Ph.D. (Environmental Sciences)  
Shou-Wei Ding, Ph.D. (Plant Pathology)  
David A. Eastmond, Ph.D. (Cell Biology and Neuroscience)  
Norman C. Ellstrand, Ph.D. (Botany and Plant Sciences)  
Brian A. Federici, Ph.D. (Entomology)  
Theodore Garland, Ph.D. (Biology)  
Sarjeet S. Gill, Ph.D. (Cell Biology and Neuroscience)  
Manuela Martins-Green, Ph.D. (Cell Biology and Neuroscience)  
Cheryl Hayashi, Ph.D. (Biology)  
John M. Heraty, Ph.D. (Entomology)  
Jodie S. Holt, Ph.D. (Botany and Plant Sciences)  
Anthony H. C. Huang, Ph.D. (Botany and Plant Sciences)  
Bradley C. Hyman, Ph.D. (Biology)  
Tao Jiang, Ph.D. *President's Chair* (Computer Science)  
Howard S. Judelson, Ph.D. (Plant Pathology)  
Isgouhi Kaloshian, Ph.D. (Nematology)  
Bai-Lian "Larry" Li, Ph.D. (Botany and Plant Sciences)  
Keh-Shin Lii, Ph.D. (Statistics)  
Xuan Liu, Ph.D. (Biochemistry)  
Dmitri A. Maslov, Ph.D. (Biology)  
Leonard P. Nunney, Ph.D. (Biology)  
Alexander S. Raikhel, Ph.D. (Entomology)  
Natasha Raikhel, Ph.D. (Botany and Plant Sciences)  
A.L.N. Rao, Ph.D. (Plant Pathology)  
David Reznick, Ph.D. (Biology)  
Mikeal L. Roose, Ph.D. (Botany and Plant Sciences)  
Neal L. Schiller, Ph.D. (Biomedical Sciences)  
Frances M. Sladek, Ph.D. (Cell Biology and Neuroscience)  
Stephen R. Spindler, Ph.D. (Biochemistry)  
Mark S. Springer, Ph.D. (Biology)  
Daniel S. Straus, Ph.D. (Biomedical Sciences)  
Jolinda A. Traugh, Ph.D. (Biochemistry)  
J. Giles Waines, Ph.D. (Botany and Plant Sciences)  
Linda L. Walling, Ph.D. (Botany and Plant Sciences)  
Susan R. Wessler, Ph.D., *Distinguished Professor of Genetics* (Botany and Plant Sciences)  
Shizhong Xu, Ph.D. (Botany and Plant Sciences)  
Zhenbiao Yang, Ph.D. (Botany and Plant Sciences)  
Raphael Zhdovetski, Ph.D. (Cell Biology and Neuroscience)

### Associate Professors

Jeffrey B. Bachant, Ph.D. (Cell Biology and Neuroscience)  
Maksim V. Bazhenov, Ph.D. (Cell Biology and Neuroscience)  
Xingping Cui, Ph.D. (Statistics)  
Sean Cutler, Ph.D. (Botany and Plant Sciences)  
Paul DeLey, Ph.D. (Nematology)  
Thomas Girke, Ph.D. (Botany and Plant Sciences)  
Hailing Jin, Ph.D. (Plant Pathology)  
Paul B. Larsen, Ph.D. (Biochemistry)  
Stefano Lonardi, Ph.D. (Computer Science)  
Morris F. Maduro, Ph.D. (Biology)  
Ernest Martinez, Ph.D. (Biochemistry)  
Constance I. Nugent, Ph.D. (Cell Biology and Neuroscience)  
Frank Sauer, Ph.D. (Biochemistry)

Patricia S. Springer, Ph.D. (Botany and Plant Sciences)

### Assistant Professors

Chia-en Angelina Chang, Ph.D. (Chemistry)  
Anupama Dahanukar, Ph.D. (Entomology)  
Greg W. Douhan, Ph.D. (Plant Pathology)  
Thomas Eulgem, Ph.D. (Botany and Plant Sciences)  
Venugopala R. Gonehal, Ph.D. (Botany and Plant Sciences)  
Karine G. Le Roch, Ph.D. (Cell Biology and Neuroscience)  
Renyi Lui, Ph.D. (Botany and Plant Sciences)  
Wenbo Ma, Ph.D. (Plant Pathology)  
James Ng, Ph.D. (Plant Pathology)  
Joao Pedra, Ph.D. (Entomology)  
Anandasankar Ray, Ph.D., (Entomology)  
Joel Sachs, Ph.D., (Biology)  
Harley Smith, Ph.D. (Botany and Plant Sciences)  
Jason Stajich, Ph.D. (Plant Pathology)  
Jan Walter, Ph.D. (Plant Pathology)

## Graduate Program

The Genetics, Genomics, and Bioinformatics Graduate Program (GGB) administers a program leading to the Ph.D. in Genetics, Genomics, and Bioinformatics. GGB is an interdepartmental program that includes faculty from the departments of Biochemistry, Biology, Botany and Plant Sciences, Cell Biology and Neuroscience, Computer Science and Engineering, Entomology, Environmental Sciences, Nematology, Plant Pathology and Microbiology, and Statistics, as well as the Division of Biomedical Sciences.

The three fields of specialization (subdisciplines) are as follows:

1. Molecular genetics
2. Evolution and population genetics
3. Genomics and bioinformatics

The program is structured to allow maximum flexibility in the design of an individual student course program and research goals. A primary objective is to allow students to develop a capability in research as rapidly as possible, consistent with the student's initial preparation.

Students are expected to meet all general requirements of the Graduate Division as printed in the Graduate Studies section of this catalog.

**Admission** Submission of GRE scores (verbal, quantitative and analytical) is mandatory for admission. Applicants with any B.A. or B.S. degree and an adequate background in the biological and physical sciences will be considered. The specific entry requirements for the three areas of specialization (Molecular Genetics, Evolution and Population Genetics, and Genomics and Bioinformatics) vary somewhat but include courses in genetics, biology, chemistry, calculus, computer science, and statistics. Please refer to the Program Guidelines for details. GGB evaluates applications on a continual basis from October to May, however, it normally considers applications for teaching and research assistantships at the same time as fellowships; therefore, students are strongly encouraged to complete their applications for admission and support as early as possible. Normally, fellowships are awarded

in January, for students entering the following fall quarter.

GGB has been identified as the graduate training “home” for UCR’s Institute for Integrative Genome Biology. The GGB faculty, partnering with colleagues in UCR’s Computer Science and Statistics departments, has developed a contemporary curriculum in the broad area of genomics, proteomics, and bioinformatics. Unique to this curriculum is the melding of microbial, animal, and plant genomics and bioinformatics within a single program. The curriculum was designed to interface with the molecular genetics and evolution and population genetics tracks.

## Doctoral Degree

The program offers the Ph.D. degree in Genetics, Genomics, and Bioinformatics.

**Course Work** All students choose a genetics subdiscipline for specialization (either molecular genetics, evolution and population genetics, or genomics and bioinformatics). Specific course requirements are selected on the basis of the subdiscipline and the student’s particular needs and objectives. The Ph.D. is a research degree, and, accordingly, the goal of the program is to train students in the theoretical and experimental foundations of modern genetics. Students are strongly encouraged to participate in lab rotations, select a major professor and begin research work early in their training (during the first year of residence).

### Written and Oral Qualifying Examinations

Students are advanced to candidacy following successful completion of a written preliminary examination and an oral qualifying examination.

### Dissertation and Final Oral Examination

Successful completion of a final oral dissertation defense is also required.

### Foreign Language Requirement

None

**Teaching Requirement** Each student must have at least one quarter of teaching experience. This requirement may be satisfied by serving as a teaching assistant in a genetics-related course.

**Normative Time to Degree** 15 quarters

## Graduate Courses

**GEN 205. Signal Transduction Pathways in Microbes and Plants (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in the biological sciences, BIOL 107A or BIOL 113 or BIOL 114 or CBNS 101; or consent of instructor. Advanced topics in signal transduction pathways that regulate growth and development in plants and prokaryotic and eukaryotic microbes. Areas covered include two-component regulatory systems; quorum sensing; signaling via small and heterotrimeric G proteins; mitogen-activated protein kinase cascades; cAMP signaling; photoreceptors; plant hormone signaling; responses to low-oxygen stress; calcium signaling; and plant pathogenesis. Cross-listed with BCH 205, BPSC 205, CMDB 205, MCBL 205, and PLPA 205. **Borkovich**

**GEN 206. Gene Silencing (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate standing, BIOL 107A or CBNS 101; or consent of instructor. An in-depth coverage of mechanisms, functions, and applications of RNAi and related gene regulatory pathways guided by small RNAs such as siRNAs and miRNAs in plants and animals. Cross-listed with CMDB 206 and MCBL 206. **Ding**

**GEN 230. Molecular Plant-Microbial Interactions (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120/MCBL 120/PLPA 120, or equivalents. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with BPSC 230, CMDB 230, and PLPA 230. **Eulgem, Jin, Kaloshian**

**GEN 240A. Advances in Bioinformatics and Genomics (4) W** Lecture, 4 hours. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102. Introduces current concepts and technologies in bioinformatics and genomics. Covers genomics foundations and gene discovery, functional genomics, macromolecules, and gene and genome evolution. **Judelson**

**GEN 240B. Advances in Bioinformatics and Genomics (4) S** Lecture, 4 hours. Prerequisite(s): GEN 240A, STAT 160B, STAT 161 (STAT 161 may be taken concurrently). Introduces modern data analysis concepts and algorithms used in bioinformatics and cheminformatics. Covers biological databases, sequence/genome analysis, phylogenetics, microarray/deep-sequencing approaches, clustering techniques, network analysis, and drug discovery methods. **Girke**

**GEN 261. Seminar in Genetics, Genomics, and Bioinformatics (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, BPSC 261, ENTM 261, and PLPA 261.

**GEN 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing and consent of instructor and graduate advisor. Faculty-directed individual study on specially selected topics in genetics, genomics, and bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GEN 292. Concurrent Studies in Genetics, Genomics, and Bioinformatics (1-4) F, W, S** Outside research, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor. Explores one or more graduate projects based on content related to an appropriate undergraduate course. Includes faculty guidance and evaluation. Taken concurrently with the undergraduate course. Course is repeatable.

**GEN 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing. Directed research in genetics, genomics, and bioinformatics. Performed prior to advancement to candidacy in preparation for dissertation projects. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**GEN 299. Research for the Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing. Original research in genetics, genomics, and bioinformatics for preparation of the dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

# Global Studies

**Subject abbreviation: GBST**

**College of Humanities, Arts, and Social Sciences**

Susan Ossman, Ph.D., Director  
Committee Office, 3116 CHASS  
Interdisciplinary Building South  
(951) 827-5524

### Committee in Charge

Muhamad Ali, Ph.D. (Religious Studies)  
Juliann Allison, Ph.D. (Political Science)  
Veronica Benet-Martinez, Ph.D. (Psychology)  
Christopher Chase-Dunn, Ph.D. (Sociology)  
Marcelle Chauvet, Ph.D. (Economics)  
Walter Clark, Ph.D. (Music)  
Anupama Dahanukar, Ph.D. (Entomology)  
Anil B. Deolalikar, Ph.D. (Economics)  
Alessandro Fornazzi, Ph.D. (Hispanic Studies)  
V.P. Franklin, Ph.D. (History)  
Miriam Lam, Ph.D. (Comparative Literature and Foreign Languages)  
Bronwyn Leebow, Ph.D. (Political Science)  
Perry Link, Ph.D. (Comparative Literature and Foreign Languages)  
Henk Maier, Ph.D. (Comparative Literature and Foreign Languages)  
Alan McHughen (CNAS, Botany and Plant Sciences)  
Toby Miller, Ph.D. (Media and Cultural Studies)  
Kurt Schwabe, Ph.D. (Environmental Sciences)  
Erika Suderburg, M.F.A. (Art)  
Stephen E. Cullenberg, Ph.D.

*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

## Major

Global Studies is a broad-based study of processes and problems that transcend national boundaries, preparing students to become global thinkers and problemsolvers for the twenty-first century. Global Studies crosses disciplines, drawing on the fine arts, social sciences, humanities, and sciences. The Global Studies major includes the study of global historical processes that have made the world more interconnected, as well as contemporary issues of global politics, violence, security, global migrations, travel, social movements, global literature, arts and media, the global economic system of trade, finance and labor, global health and disease, and environmental change and sustainability. Students are grounded in two disciplines, as well as a single geographic area of study and a foreign language.

Global Studies is a way to give powerful support to re-conceptualize the meaning of place in the contemporary world and to retool faculty and students to become global thinkers. It focuses on transnational processes rather than relations among nations.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Global Studies are as follows:

Students will not be admitted into the major until they have completed either GBST 001 or GBST 002 with a "C-" grade or better.

1. Lower-division requirements (7 courses [at least 24 units] plus foreign language):

- a) GBST 001, GBST 002
- b) Two introductory courses (courses numbered 001–099) in each of two different disciplines.
- c) Proficiency in a foreign language at the sixth-quarter level
- d) Two courses in world history

2. Upper-division requirements (45 units)

Students must select eight courses with significant global content in at least two different disciplines and two courses in a single area, and at least one 100-level GBST course.

ANTH 108, ANTH 109/WMST 109, ANTH 119, ANTH 126/AST 123/DNCE 123/MUS 123, ANTH 128/AST 128/DNCE 128/MUS 128/THEA 176, ANTH 136, ANTH 140G, ANTH 140I, ANTH 140P, ANTH 163, ANTH 164/LNST 164/ WMST 164, ANTH 168/ETST 148/LNST 168, ANTH 170/BPSC 170, ANTH 176/AST 127/DNCE 127/ETST 172/MUS 127

AHS 115/LNST 115, ANTH 143/WMST 185  
AST 123/ANTH 126/DNCE 123/MUS 123,  
AST 127/ANTH 176/DNCE 127/ETST  
172/MUS 127, THEA 176/ANTH 128/AST  
128/DNCE 128/MUS 128, BPSC 170/ANTH  
170, BUS 114, BUS 138, BUS 154B, BUS  
178/ECON 178, BUS 185

CPLT 112/CLA 112/RLST 117, CPLT 121,  
CPLT 125, CPLT 141, CPLT 160 (E-Z),  
CRWT 143

DNCE 123/ANTH 126/AST 123/MUS 123,  
DNCE 127/ANTH 176/AST 127/ETST  
172/MUS 127, DNCE 128/ANTH 128/AST  
128/MUS 128/THEA 176, DNCE 173 (E-  
Z)/MCS 153 (E-Z)

ECON 124, ECON 170 (E-Z), ECON 182,  
ECON 183, ECON 185/LNST 185, ECON  
187/ LNST 187

ENGL 121 (E-Z)

ETST 100, ETST 104, ETST 109G,  
ETST 118/MUS 129, ETST 148/ANTH  
168/LNST 168, ETST 166, ETST 175/WMST  
175

MCS 125 (E-Z)/LNST 125 (E-Z)/SPN 125 (E-  
Z), MCS 139/SOC 139, MCS 145 (E-  
Z)/ENGL 145 (E-Z), MCS 171/SPN 171,  
MCS 174 (E-Z)/CPLT 174 (E-Z)

GBST 090, GBST 191, GBST 195A, GBST  
195B, GBST 195C, GBST 198-I

SPN 102A, SPN 122B, SPN 145, SPN  
179/LNST 109/MCS 179/WMST 179, SPN  
188

HIST 151

LNST 105/MCS 185/SPN 185, LNST  
164/ANTH 164/WMST 164, LNST  
168/ANTH 168/ETST 148, LNST 185/ECON  
185, LNST 187/ECON 187

MUS 122, MUS 123/ANTH 126/AST  
123/DNCE 123, MUS 125, MUS 126/ANTH  
177/WMST 126, MUS 127/ANTH 176/AST  
127/DNCE 127/ETST 172, MUS 129/ETST  
118

POSC 107, POSC 110, POSC 120,  
POSC 124, POSC 126, POSC 128, POSC  
133, POSC 150, POSC 160, POSC 267,  
POSC 268

PSYC 148

PBPL 191

RLST 175, RLST 246

SOC 122, SOC 123, SOC 161, SOC 181,  
SOC 184

THEA 161, THEA 176/ANTH 128/AST 128/  
DNCE 128/MUS 128

URST 178/AHS 178, URST 182/SOC 182

WMST 108/PHIL 108, WMST 109/ANTH  
109, WMST 126/ANTH 177/MUS 126,  
WMST 162/RLST 162, WMST 164/ANTH  
164/LNST 164, WMST 175/ETST 175,  
WMST 179/LNST 109/MCS 179/SPN 179

3. Capstone requirement (5 units)

Students are required to complete their major with a capstone experience. The capstone must examine at least one global issue. It may be an advanced seminar on a topic of global significance, an independent major paper or research project supervised by a Global Studies faculty member, or a study abroad program approved by the Chair of Global Studies.

## Minor

1. Lower-division requirements (22 units)

- a) GBST 001, GBST 002
- b) Proficiency of a foreign language at the sixth quarter level
- c) One additional course in world history, taken in consecutive sequence with the first world history course (can be used to satisfy college breadth)

2. Upper-division requirements (7 courses, 45 units)

- a) Seven Upper-division requirements (45 units). Students must select seven (7) courses with significant global content in at least two different disciplines and two (2) courses in a geographic area. Students may focus on the humanities or social science, but no more than seven (7) courses may be exclusively in either humanities or social science.

ANTH 108, ANTH 109/WMST 109, ANTH  
119, ANTH 126, ANTH 128/AST 128/  
DNCE 128/MUS 128, THEA 176, ANTH  
136, ANTH 140G, ANTH 140-I, ANTH

140P, ANTH 163, ANTH 164/LNST 164/  
WMST 164, ANTH 168/ETST 148, LNST  
168, ANTH 170/BPSC 170, ANTH 176

AHS 115/LNST 115, AHS 143

AST 123, AST 127/ANTH 176/DNCE 127/  
ETST 172/MUS 127,

BUS 114, BUS 138, BUS 154B, BUS  
164, BUS 178, BUS 185

CPLT 112, CPLT 121, CPLT 125, CPLT  
141, CPLT 160

CRWT 143

DNCE 123, DNCE 127, DNCE 128/ANTH  
128/AST 128/MUS 128/THEA 176

ECON 124, ECON 170, ECON 182, ECON  
183, ECON 185/LNST 185,  
ECON 187/LNST 187

ENGL 121

ETST 100, ETST 104, ETST 109G, ETST  
118/MUS 129, ETST 148/ANTH 168/  
LNST 168, ETST 166, ETST 175/WMST  
175

MCS 125, MCS 139, MCS 145, MCS 171,  
MCS 174

GBST 090, GBST 191, GBST 195A,  
GBST 195B, GBST 195C, GBST 198-I  
SPN 102A, SPN 122B, SPN 145, SPN  
179, SPN 188

HIST 151

LAS 105, LAS 168, LAS 187

LNST 164/ANTH 164/WMST 164,  
LNST 168/ANTH 168/ETST 148,  
LNST 185/ECON 185,  
LNST 187/ECON 187

MUS 122, MUS 123, MUS 125,  
MUS 126/ANTH 177/WMST 126,  
MUS 127, MUS 129/ETST 118

POSC 109/RLST 173, POSC 110, POSC  
120, POSC 124, POSC 125, POSC 126,  
POSC 128, POSC 133, POSC 150,  
POSC 160, POSC 268, POSC 267

PSYC 148

PBPL 191

RLST 113, RLST 144, RLST 145, RLST  
149, RLST 175, RLST 246, RLST 246C

SOC 122, SOC 123, SOC 161, SOC 181,  
SOC 184

THEA 161, THEA 176/ANTH 128/AST  
128/DNCE 128/MUS 128

URST 178

WMST 108/PHIL 108, WMST 109/ANTH  
109, WMST 126/ANTH 177/MUS 126,  
WMST 162, WMST 164/ANTH 164/  
LNST 164, WMST 175/ETST 175, WMST  
179

## Lower-Division Courses

### GBST 001. Global History, Culture, and Ideas (5)

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. A survey of the historical and cultural processes that have made the world more interconnected.

**GBST 002. Global Socioeconomic and Political Processes (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): GBST 001 with a grade of "B" or better is recommended for freshmen. A survey of the economic, political, and physical processes that have made the world more interconnected.

**GBST 090. Special Studies (1-3)** Individual study, 3-9 hours. Prerequisite(s): consent of program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 8 units.

## Upper-Division Courses

**GBST 100. Global Cities (4)** Lecture, 3 hours; field, 3 hours. Prerequisite(s): GBST 001 or GBST 002. A study of urban life as it has emerged in various parts of the world through application of theories of space and the city. Considers how colonialism, urban planning, migration, and trade have influenced contemporary urban environments. Projects explore the city as representation and lived experience in Riverside and Southern California.

**GBST 110. Global Migrations and Movements (4)** Lecture, 3 hours; field, 3 hours. Prerequisite(s): GBST 001 or GBST 002. Examines migration and mobility (both global and interregional). Also addresses economic development and displacement of populations and issues of identity and subjectivity in the context of recent theories of reshaping borders, ideas of self, political and social entities, and transnational issues.

**GBST 130. Management of International Water (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores basic concepts of international water law. Examines how these concepts, as well as conflict definitions, negotiation principles, and cooperation principles, are applied to international waters. Includes analysis of several major international water cases utilizing contemporary literature.

**GBST 169. From the Maghreb to the Middle East (4)** Lecture, 3 hours; written work, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or GBST 001 or GBST 002 or consent of instructor. An introduction to the peoples and societies of North Africa and the Middle East. Follows the travels of Ibn Battutah, Ibn Khaldun, and Rafik al Tahtawi. Topics include religion, migration, gender, political organization, the global Middle East, Orientalism, and cultural production. Cross-listed with ANTH 169.

**GBST 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): consent of program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 15 units.

**GBST 191. Seminar in Global Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines contemporary issues and topics in global studies that are not part of the regular curricular offerings. Content of the course varies and is announced as the course is offered. Course is repeatable to a maximum of 16 units.

**GBST 193. Senior Seminar (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): senior standing or consent of instructor. Senior capstone course for global studies majors. Examines connections between students' academic experience and their plans for the future. Includes a research paper, as well as speakers on issues addressing professional choices in a global context.

**GBST 195A. Senior Thesis (4)** Thesis, 12 hours. Prerequisite(s): senior standing; consent of instructor. Preparation of a substantial paper based on original research. The student works independently with a faculty member. May be undertaken as a one-, two-, or three-quarter course (GBST 195A, GBST 195B, GBST 195C). Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned.

**GBST 195B. Senior Thesis (4)** Thesis, 12 hours. Prerequisite(s): GBST 195A. Preparation of a substantial paper based on original research. The student works independently with a faculty member. May be undertaken as a one-, two-, or three-quarter course (GBST 195A, GBST 195B, GBST 195C). Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned.

**GBST 195C. Senior Thesis (4)** Thesis, 12 hours. Prerequisite(s): GBST 195B. Preparation of a substantial paper based on original research. The student works independently with a faculty member. May be undertaken as a one-, two-, or three-quarter course (GBST 195A, GBST 195B, GBST 195C).

**GBST 198-I. Individual Internship in Global Studies (1-12)** Internship, 2-24 hours; term paper, 1-12 hours. Prerequisite(s): consent of instructor. Internship in a public or quasi-public agency or business concern in matters relating to global studies. Requires a summary paper. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

## Hispanic Studies

**Subject abbreviations: SPN and PORT**  
**College of Humanities, Arts, and Social Sciences**

David K. Herzberger, Ph.D., Chair  
Department Office, 2402 Humanities  
and Social Sciences  
(951) 827-3746 x1421  
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### Professors

David K. Herzberger, Ph.D.  
James A. Parr, Ph.D.  
Marina Pianca, Ph.D.  
Raymond L. Williams, Ph.D.

### Professors Emeriti

Cándido Ayllón, Ph.D.  
Ana Mariá Fagundo, Ph.D.  
Philip O. Gericke, Ph.D.  
William W. Megenney, Ph.D.  
Hugo Rodríguez-Alcalá, Ph.D., J.D.

### Associate Professor

Benjamin Liu, Ph.D.

### Assistant Professors

Alessandro Fornazzari, Ph.D.  
Marta Hernandez-Salvan, Ph.D.

\* \*

### Visiting Assistant Professors

Michele Back, Ph.D.  
Oscar Perea-Rodriguez, Ph.D.

### Cooperating Faculty

Freya Schiw, Ph.D. (Media & Culture Studies)

### Lecturers

Mari Carmen Ballester, M.A.  
Martin Navarro, M.A.  
Teresa Toscano, Ph.D.  
Mirta Vargas, Ph.D.

**Foreign Language Placement Examination** A placement examination is required of all freshmen entering the College of Humanities, Arts,

and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and **placementtest.ucr.edu** for date and time. Transfer students who have taken a college-level language course cannot take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

## Major

The Department of Hispanic Studies offers a B.A. degree in Spanish. A student may major in Spanish by specializing in one of three undergraduate areas.

The **Literature Option** is intended for students who are primarily interested in a liberal arts education in general and literary studies in Spanish specifically. Students who choose the Literature Option can pursue high school teaching, graduate study in Latin American or Spanish literature, or other professional careers, as well as advanced study.

The **Linguistics Option** is designed for students who are especially interested in the Spanish language or Hispanic linguistics. Students follow this option as preparation for elementary, middle school, or high school language teaching, as a second major in fields where bilingualism is useful, and as preparation for advanced study in Hispanic linguistics.

The **Cultural Studies Option** is intended for students with an interest in the intersections of society, power, and culture. It offers a unique opportunity to acquire critical interdisciplinary skills in cultural analysis from a Hispanic perspective. It explores numerous forms of Spanish, Latin American and transatlantic cultural practices including film, television, music, visual arts, performance, literature, testimonials, essays, and cultural critique. The Cultural Studies Option is relevant for students considering careers in high school teaching, media work, advertising, creative arts, multimedia projects, international studies, and graduate studies.

All of the above options should be considered with double majors, particularly majors such as Anthropology, Classics, English, History, Latin American Studies, Linguistics, or Media and Cultural Studies.

## Education Abroad Program

The EAP is an excellent opportunity for the student to be immersed in the languages and culture of the Hispanic or Luso-Brazilian worlds while earning units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at **internationalcenter.ucr.edu** or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student

Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Spanish are as follows:

Option Requirements — Choose one option

### Cultural Studies Option

Upper-division requirements (11 courses [at least 44 units]):

1. SPN 101A and SPN 101B, or SPN 109A and SPN 109B
2. SPN 110 (prerequisite for all upper-division literature courses)
3. One course from SPN 122A, SPN 122B, SPN 165, SPN 188
4. Two courses from SPN 125 (E-Z)/MCS (E-Z)/LNST 125 (E-Z), SPN 145, SPN 171/MCS 171, SPN 172, SPN 179/MCS 179/LNST 109/WMST 179, SPN 185/MCS 185/LNST 185, SPN 187
5. Four upper-division elective courses (At least three of which must be in Spanish. One may be in a related area.)
6. SPN 193

### Linguistics Option

Upper-division requirements (11 courses [at least 44 units])

1. SPN 101A and SPN 101B or SPN 109A and SPN 109B
2. SPN 105, SPN 106A, SPN 106B
3. SPN 110 (prerequisite for all upper-division literature courses)
4. Four upper-division elective courses (At least two of which must be in Spanish; it is highly recommended that students take LING 111 and LING 141)
5. SPN 193

### Literature Option

Upper-division requirements (11 courses [at least 44 units])

1. SPN 101A and SPN 101B or SPN 109A and SPN 109B
2. SPN 110 (prerequisite for all upper-division literature courses)
3. SPN 180A or SPN 180B

4. SPN 181A or SPN 181B

5. Five upper-division elective courses in Spanish

6. SPN 193

The Department of Hispanic Studies recommends, for all three of the above options, the study of one of the other languages (besides Spanish) spoken in Latin America, the Caribbean, or Spain, such as Portuguese (PORT 101A, PORT 101B, PORT 101C) and French. Less commonly taught languages such as Aymara, Catalan, Euskera, Galician, Guarani, Haitian Creole, Mapuche, Maya, Nahuatl, and Quechua, among others, are encouraged.

## Minor

Requirements for the minor in Spanish are as follows (24 units):

1. SPN 101A and SPN 101B or SPN 109A and SPN 109B
2. SPN 110
3. Three upper-division courses in Spanish

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Graduate Program

The Department of Hispanic Studies offers the M.A. and Ph.D. degrees in Spanish.

The graduate program in Spanish is designed to prepare scholars for teaching and research in Spanish and Latin American literature and cultural studies. It is organized primarily for students seeking the Ph.D. degree, although the M.A. degree is awarded in the course of a student's progress. A small number of students are admitted who intend to complete the M.A. only as advanced study for teaching in high schools or community colleges.

The faculty in Hispanic Studies offers a wide and diverse group of graduate courses in literary and cultural studies, as well as a core group of courses in linguistics. Research and teaching interests include all areas of Spanish literature beginning with the fifteenth century, and Latin American literature from its origins to the present. Faculty also have strong research and teaching profiles in cultural studies, including Latin American film, gender studies, theories of the body, historiography and fiction, and culture and power.

**Admission** All domestic applicants to the graduate programs must supply GRE scores for the verbal, analytical, and quantitative tests.

## Master's Degree

The Department of Hispanic Studies offers the M.A. in Spanish.

The M.A. in Spanish is designed for students who hold the B.A. in Spanish and who seek to broaden their knowledge of Hispanic literary and

cultural traditions through advanced study. The M.A. is generally intended for students who plan to pursue the Ph.D. at UCR. As part of their preparation in Hispanic literary and cultural studies, students are introduced to advanced concepts of literary theory and current debates in cultural studies. Students can also take seminars in areas such as Hispanic linguistics and Brazilian literature.

**Admission** Applicants normally have a B.A. in Spanish that includes at least five courses in the literature and culture of Spain and Latin America.

**Teaching Assistantships** Most students in the program are Teaching Assistants in the Department of Hispanic Studies; their normal workload includes language teaching and taking three graduate courses per quarter. Teaching Assistants receive training in language instruction as part of their graduate study and teaching duties (and must take a teaching methods course during their first quarter of assuming their duties as Teaching Assistants).

**Course Work** Candidates complete a minimum of 48 graduate units in literature and linguistics, with at least five graduate courses in Spanish Peninsular literature and at least five courses in Latin American literature. The Latin American literature courses SPN 257, SPN 273A, SPN 273B, SPN 273C can be substituted for Spanish Literature courses. (In addition to Spanish and Latin American literature, students may fulfill their 48-unit requirement by taking courses approved by the graduate advisor in Linguistics or Comparative Literature.)

**M.A. Examination** Near the end of this two-year program, students take a four-hour written examination, followed by a one-hour oral examination administered one or two weeks after the written examination. This M.A. examination (written and oral) is based on the texts on the M.A. reading list and course work. The M.A. reading list consists of approximately 60 major works of Spanish and Latin American literatures.

**Foreign Language Requirement** Candidates must demonstrate a reading knowledge of another foreign language by satisfactorily completing a graduate course in Brazilian literature offered in the Department of Hispanic Studies, an upper-division literature course in the target language or a departmental foreign language exam.

## Doctoral Degree

The Department of Hispanic Studies offers the Ph.D. in Spanish to train students for academic positions as scholars and teachers.

The program emphasizes advanced course work and independent research, culminating in the doctoral dissertation. It is designed to provide in-depth coverage of the student's primary area of study, while also assuring ample coverage of the broad field of Hispanic Studies.

**Admission** Students admitted with the M.A. from other institutions must take an examination at the end of the first year for diagnostic purposes. Candidates who hold the M.A. from

UCR must be recommended by the faculty to continue for the Ph.D.

**Course Work** There is a minimum course requirement of 24 units beyond the M.A. In practice, doctoral students usually find that more than the minimum is advisable for doctoral training.

**Long Paper** As part of their preparation in their major area of specialization, students present a paper of 40 to 50 pages in length, representing scholarly research and analysis in their chosen field of study. The long paper forms the basis of the doctoral dissertation.

#### Written and Oral Qualifying Examinations

Students choose two areas of concentration as examination areas. One area is the field of major emphasis; a second area or topic is selected in consultation with the chair of the guidance committee.

The area of specialization is defined by the long paper and dissertation topic. The doctoral examination consists of a five-hour written examination (three hours in the major field and two hours in the secondary field or topic), followed by an oral examination of approximately two hours. The oral examination deals with the major and secondary examinations and the long paper. The written and oral examinations are conducted by the qualifying committee nominated by the graduate advisor in consultation with the student and appointed by the graduate dean. Upon the successful completion of the written and oral qualifying examinations, the student is recommended to the graduate dean for advancement to candidacy.

**Language Requirements** In addition to Spanish and English, the candidate must demonstrate a reading knowledge of one other language. Students specializing in Latin American literature must select Portuguese as this language. This requirement may be fulfilled by departmental examination or by satisfactory completion of one Brazilian literature class.

**Dissertation and Final Oral Examination** Students prepare a dissertation presented as prescribed by the Graduate Division under the direction of the candidate's dissertation committee. After completion of the dissertation, the candidate is examined by the dissertation committee. This examination normally takes the form of a public presentation by the candidate followed by questions from the committee.

**Normative Time to Degree** 9 quarters (15 quarters for students without an M.A.)

## Spanish

### Lower-Division Courses

**SPN 001. Elementary Spanish (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): Student is required to take Spanish placement examination. An introduction to the sound system and grammar of Spanish, with attention to the development of the four

skills: understanding, speaking, reading, and writing. Classes conducted in Spanish insofar as possible. Audio-lingual and computer-based learning materials are available in the language laboratory.

**SPN 002. Elementary Spanish (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): SPN 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Spanish, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Spanish insofar as possible. Audio-lingual and computer-based learning materials are available in the language laboratory.

**SPN 003. Elementary Spanish (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): SPN 002 with a grade of "C-" or better or equivalent. An introduction to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Spanish insofar as possible. Audio-lingual and computer-based learning materials are available in the language laboratory.

**SPN 004. Intermediate Spanish (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): SPN 003 with a grade of "C-" or better or equivalent. A comprehensive review of the basic grammatical structures of Spanish, vocabulary building, development of conversation and composition skills, and readings of literary and social interest. Classes conducted in Spanish.

**SPN 005. Intermediate Spanish (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): SPN 004 or equivalent. A comprehensive review of the basic grammatical structures of Spanish, vocabulary building, development of conversation and composition skills, and readings of literary and social interest. Classes conducted in Spanish.

**SPN 006. Intermediate Spanish (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): SPN 005 or equivalent. A comprehensive review of the basic grammatical structures of Spanish, vocabulary building, development of conversation and composition skills, and readings of literary and social interest. Classes conducted in Spanish.

#### SPN 012. Myths and Cultures of Latin America, the Caribbean, and Spain: Transatlantic Currents (4)

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Examines cultural themes from a transatlantic perspective, through study of literature, film, and visual arts. Topics include chronicles of the conquest, cultures of the baroque, religious traditions and conflicts, the incorporation of popular culture into the literary tradition, contemporary writers, and cinema. Course is conducted in English.

#### SPN 046. Introduction to Latin American Film (5)

Lecture, 3 hours; screening, 3 hours; discussion, 1 hour. Provides an historical overview of Latin American film production. Introduces students to film industries, revolutionary cinema, the role of television, and recent international co-productions. Cross-listed with MCS 046.

**SPN 090. Special Studies (1-3)** To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems. Course is repeatable.

### Upper-Division Courses

**SPN 101A. Advanced Oral and Written Composition (4)** Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): SPN 006. Designed

for nonnative speakers to practice speaking and writing in Spanish and to review basic grammar. Emphasis is on composition, editing, and conversation practice. Class is conducted in Spanish. Native speakers without knowledge of college-level grammar should take SPN 109A. Credit is awarded for only one of SPN 101A or SPN 109A.

#### SPN 101B. Advanced Oral and Written Composition (4)

Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): SPN 101A. Designed for nonnative speakers to practice speaking and writing in Spanish and to review basic grammar. Emphasis is on composition, editing, and conversation practice. Class is conducted in Spanish. Native speakers without knowledge of college-level grammar should take SPN 109B. Credit is awarded for only one of SPN 101B or SPN 109B.

**SPN 102A. Introduction to Spanish Culture (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 101B or SPN 109B or equivalent. Introduction to Spanish culture and civilization from the Roman times to the present. Readings cover history, art, architecture, literatures, and other aspects of culture and civilization. Provides background for courses on the literature of Spain. Course is taught in Spanish.

#### SPN 102B. Introduction to Latin American Culture (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 101B or SPN 109B or equivalent. Introduction to Latin American culture and civilization from pre-Columbian times to the present. Emphasis is on the period from postcolonial independence to the present. Readings cover history, art, architecture, literatures, and other aspects of culture and civilization. Provides background for courses on the literature of Latin America. Course is taught in Spanish.

#### SPN 103. Spanish Culture and Civilization in Spain (4)

Lecture, 60 hours per quarter; discussion, 20 hours per quarter. Prerequisite(s): SPN 101B or SPN 109B; consent of instructor. Provides intensive study of Spain within its European and New-World contexts. Emphasizes expansion and retraction, as well as the roles of religion and authority. Course taught in Spain in Spanish. Offered in summer only.

#### SPN 105. The Phonology of the Spanish Language (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): LING 020; either the SPN 101A and SPN 101B sequence or the SPN 109A and SPN 109B sequence. A descriptive and normative analysis of the phonological system of the Spanish language, with attention given to the phonetic characteristics of contemporary peninsular and Hispano American Spanish.

#### SPN 106A. Structure of the Spanish Language (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 105. An introduction to descriptive and applied techniques in morphology and morphophonemics of the Spanish language as found in Spain and Spanish America.

#### SPN 106B. Structure of the Spanish Language (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 106A. An introduction to descriptive and applied techniques in the morphosyntax of the Spanish language as found in Spain and Spanish America.

**SPN 109A. Spanish for the Native Speaker (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): a sufficiently high test score on the Spanish placement examination, as determined by the Hispanic Studies faculty. Designed for the native speaker with little or no experience with Spanish grammar and composition. Emphasis is on basic grammar, written accents, orthography, and composition. The class is conducted

in Spanish. Credit is awarded for only one of SPN 101A or SPN 109A.

**SPN 109B. Spanish for the Native Speaker (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 109A. Designed for the native speaker with little or no experience with Spanish grammar and composition. Emphasis is on basic grammar, written accents, orthography, and composition. The class is conducted in Spanish. Credit is awarded for only one of SPN 101B or SPN 109B.

**SPN 110. Introduction to Literary Criticism and Analysis (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): the SPN 101A and SPN 101B sequence or the SPN 109A and SPN 109B sequence. An introduction to the methods and techniques of literary analysis. Practice in textual explication, with regular writing assignments.

**SPN 111 (E-Z). Hispanic Literature in Translation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Reading and discussion of works of major Spanish and Spanish American writers. Topic will vary from quarter to quarter. F. Latin American Literature and Film; M. Masterpieces in Spanish American Modernism; Q. *Don Quijote*; R. The Theatre of the Spanish Golden Age; T. Latin American Theatre in Translation; W. Women in Latin American Literature. No knowledge of Spanish required. May be counted toward the Spanish major with consent of instructor.

**SPN 120A. Major Topics in Hispanic Literature (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Reading and analysis of short texts of authors from Spain, Latin America, and the United States.

**SPN 120B. Major Topics in Hispanic Literature: Spain (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Reading and analysis of major texts of authors from Spain.

**SPN 120C. Major Topics in Hispanic Literature: Latin America (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Reading and analysis of major texts of authors from Latin America. Cross-listed with LNST 120.

**SPN 122A. Introduction to Hispanic Cultural Studies (4)** Lecture, 3 hours; extra reading, 2.5 hours; screening, 6 hours per quarter. Prerequisite(s): SPN 110. An introduction to cultural studies in Latin America and Spain. Explores the relation between high and popular culture, mass media and subcultures, stories and history, narrative and memory, representation and gender, and technology and the notion of "alterity."

**SPN 122B. Transatlantic Cultural Studies (4)** Lecture, 3 hours; extra reading, 2.5 hours; screening, 6 hours per quarter. Prerequisite(s): SPN 110. Offers a transatlantic cultural studies perspective that explores the shared histories of Spain, the Caribbean, and Latin America. Examines issues such as the legacies of the conquest of America and the slave trade, the nation-building process, theories of *mestizaje* and transculturation, and transatlantic exile.

**SPN 125 (E-Z). Topics in Latin American Film and Media (5)** Lecture, 3 hours; screening, 3 hours; extra reading, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of a theme or issue in Latin American film and media. E. Indigenous Video and Latin America. Cross-listed with LNST 125 (E-Z) and MCS 125 (E-Z).

**SPN 140 (E-Z). Renaissance and Baroque Literatures (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. A concentrated study of a genre, movement, author, or outstanding

work of Spanish literature of the sixteenth or seventeenth century. E. Renaissance and Baroque Literature; H. *La Celestina*; J. Golden Age of Poetry; P. La Novela Picaresca; T. Spanish Theatre of the Golden Age.

**SPN 141. Cervantes (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. An overview of Cervantes' texts within their time and place; discussion of his importance in the development of the novel; and close reading of *Don Quixote*.

**SPN 142. Continuities of the Spanish Golden Age in Modern Latin America (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. Introduces the relationship of key golden age and Spanish colonial texts to modern Latin American narrative and essay. Explores questions of literary genealogy as well as issues of cultural identity and the reclamation of history.

**SPN 145. Performative Expression in Contemporary Latin American Culture (4)** Lecture, 3 hours; screening, .5 hours; individual study, 2.5 hours. Prerequisite(s): SPN 110. Addresses divisions and continuities between word and action and art and politics in Latin American short stories, films, and Web projects. Explores performative language that questions separations between saying and doing. Considers performance art as the disruption—or reiteration—of frameworks dividing artistic production from reality. Conducted in Spanish.

**SPN 155. The Generation of 1898 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. A study of the major writers constituting the generation emerging from the national conflict produced in Spain as a consequence of the defeat in the Spanish American War. Readings and discussion of essays, fiction, and poetry of writers such as Unamuno, Baroja, Valle-Inclan, Antonio Machado, Azorín, and Benavente.

**SPN 160 (E-Z). Studies in Twentieth-Century Spanish Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. A concentrated study of a genre, period, author, or outstanding work of twentieth-century Spanish literature. E. Spanish Poetry; N. Contemporary Novel in Spain; T. Contemporary Theatre in Spain.

**SPN 165. Spanish and Latin American Cultural Studies: Violence and Representation (4)** Lecture, 3 hours; screening, 1 hour; extra reading, 2 hours. Prerequisite(s): SPN 110. Introduces students to a cultural studies approach to Latin American and Spanish texts and theorists. Covers the Southern Cone dictatorships, post-Franco Spain, and emerging urban imaginaries. Involves readings and discussions of cultural criticism, films, urban chronicles, and literary texts.

**SPN 170 (E-Z). Studies in Nineteenth- and Twentieth-Century Latin American Literature (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SPN 110. A concentrated study of a genre, movement, author, or outstanding work of Latin American literature. E. Short Story; F. Censorship, Self-Censorship, Anti-Censorship; L. Nineteenth-Century Latin American Novel; M. Twentieth-Century Latin American Novel; N. Mexican Novel; P. Poetry; R. Voyages through Latin America: A Cultural and Literary Vision; T. Spanish American Theatre.

**SPN 171. Reel to Real: Latin American Film and Social Change (4)** Seminar, 3 hours; individual study, 1 hour; screening, 1.5 hours; term paper, .5 hours. Prerequisite(s): SPN 110. Introduces Latin American film as it articulates with contemporary history and current events. Cross-listed with MCS 171.

**SPN 172. The Testimonio and Cultural History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. Explores the relation between the testimonial genre and the emergence of Latin American cultural studies, subaltern studies, and postcolonial studies. Involves readings and discussions of a representative sample of testimonial literature and criticism.

**SPN 179. Gender, Media, and Latin America (5)** Lecture, 3 hours; screening, 3 hours; outside research, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores the way Latin Americans have thought of and represented gender across a variety of media, including essays, film, novel or short story, and performance. Compares the possibilities and limitations of these media for representing gender in the Latin American context. Cross-listed with LNST 109, MCS 179, and WMST 179.

**SPN 180A. Survey of Spanish Literature, Middle Ages-1699 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Survey of literary movements and trends and major writers of medieval and Golden Age Spanish literature. Covers writers such as Cervantes, Lope de Vega, Tirso de Molina, Quevedo, and Gongora.

**SPN 180B. Survey of Spanish Literature, 1700-Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. Survey of literary movements and trends and major writers of eighteenth-, nineteenth-, and twentieth-century Spanish literature. Readings in fiction, poetry, drama, and essay. Covers writers such as Moratín, Becquer, Galdos, Larra, Azorín, and García Lorca.

**SPN 181A. Survey of Spanish American Literature, Discovery to Modernismo (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. Survey of literary movements and trends and major Spanish American writers from the colonial period to *Modernismo*. Readings are in fiction, poetry, drama, and essay. Covers writers such as Sor Juana Inés de la Cruz, Echeverría, Sarmiento, and Martí.

**SPN 181B. Survey of Spanish American Literature, Modernismo to the Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. Survey of literary movements and trends and major Spanish American writers from *Modernismo* to the present. Readings are in fiction, poetry, drama, and essay. Covers writers such as Darío, Azuela, Vallejo, Huidobro, García Márquez, Fuentes, Páez, Buenaventura, and Elena Poniatowska.

**SPN 185. Imagining the Nation: Film and Media in Latin America (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Study of the role of media and film in creating a national imaginary in Latin America. Focus is on one region or nation—such as the Andes, the Caribbean, Mexico, Argentina, or Chile—relating local history to the global context. Course is repeatable as topics change to a maximum of 8 units. Cross-listed with LNST 105 and MCS 185.

**SPN 187. Latin American Science Fiction (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SPN 110. Focuses on intersections between literature and scientific discourse. Considers how popular notions of science inform the production and reading of the literary text. Topics may include the function of power in scientific discourse, the politics of alternative universes, and science and gender. Course is repeatable as content changes to a maximum of 8 units.

**SPN 188. Interdisciplinary Studies: The Hispanic World (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): SPN 110. Includes reading, research, and discussion on particular problems relat-

ed to Spain and Latin America that lend themselves to interdisciplinary analysis. Course is repeatable as topics change to a maximum of 8 units.

**SPN 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): SPN 110; consent of Department Chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable.

**SPN 192. Tutorial Activities (2)** Activity, 6 hours. Prerequisite(s): SPN 110; senior standing; consent of Department Chair. Under faculty supervision, students conduct discussion sections of elementary Spanish courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

**SPN 193. Senior Seminar in the Literatures and Cultures of the Hispanic World (4)** Seminar, 3 hours; extra reading, 2 hours; outside research, 1 hour. Prerequisite(s): eight upper-division Spanish courses or consent of instructor. Introduction to research methods and documentation necessary for completion of a long final project. Specific topics vary depending on the instructor. Intended for Spanish majors. Course is repeatable as topics change to a maximum of 8 units.

**SPN 199H. Senior Honors Research (1-5)** Course is repeatable.

## Graduate Courses

**SPN 203. Problems in Spanish Linguistics (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. An introduction to the historical and theoretical evolution of Spanish linguistics as a scholarly discipline. Major topics will include perennial problems, schools, and history of linguistics.

**SPN 207. History of the Spanish Language (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; SPN 105, SPN 106A, SPN 106B, or equivalents. The development of the Spanish language from its origins to modern times.

**SPN 208. Linguistic Approaches to Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Presentation and discussion of semantics, speech acts, and speech genres, and discourse analyses in the framework of contemporary linguistic studies. Topics of inquiry include speech act theory, fiction and nonfiction discourse, pragmatics, syntax, frames of reference, and narrative tenses. Other linguistic levels (i.e., phonology, morphology) are also discussed.

**SPN 220. Criticism and Critical Documentation (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Covers strategies of reading and analysis. Topics may include critical approaches such as formalism, new criticism, structuralism, deconstruction, and new historicism; psychoanalysis; gender studies; performance studies; and cultural studies. Also may include practice in Modern Language Association (MLA) documentation. Course is repeatable.

**SPN 251. Seminar in the Literature of the Middle Ages and Early Renaissance (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Intensive study of selected topics in Spanish literature through the fifteenth century. Topics may vary. May be repeated for credit.

**SPN 257. Seminar in Hispanic Civilization (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Intensive study of special topics in Hispanic civilization. Topics vary. Course is repeatable to a maximum of 12 units.

**SPN 258 (E-Z). Genres of Hispanic Literature (4)** Seminar, 3 hours; individual study, 3 hours.

Prerequisite(s): graduate standing. Close reading, analysis, and discussion of the major Hispanic texts, plays, and poems. E. Hispanic Literature and the Art of Poetry; S. The Satiric Tradition in Hispanic Letters.

**SPN 261 (E-Z). Studies in Golden Age Literature (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Intensive study of topics in Spanish literature of the sixteenth and seventeenth centuries. G. The Spanish Comedia; I. Spain and the Western Tradition.

**SPN 262. Seminar in Don Quijote (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Critical and theoretical perspectives on Cervantes' masterpiece; assumes prior close reading of the text. Emphasis on narratology and genre, pointing toward a deconstructive/reconstructive reading.

**SPN 264. Seminar in Spanish Literature of the Nineteenth Century (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Study of a genre, movement, or outstanding author of this period. Topics may vary. May be repeated for credit.

**SPN 269 (E-Z). Studies in Twentieth-Century Spanish Literature (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Study of authors, movements, or genres from the Generation of '98 to the present. E. Spanish Literature of the Generation of '98; F. Spanish Poetry: The Avant-Garde and the Generation of '27; P. Postwar Spanish Novel (1940 to Present); T. Theatre of the Postwar and Democratic Epoch (1940-2000). Course is repeatable to a maximum of 8 units.

**SPN 270 (E-Z). Latin American Literature (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Study of the main authors and schools in Latin American literature. F. Latin American Film; K. The Mexican Novel; O. The Modern Novel in Colombia; Q. The Postmodern Novel in Latin America (1968-Present); T. Latin American Theatre: Sixteenth through Twentieth Centuries; X. Twentieth-Century Spanish American Poetry; Y. The Latin American Avant-Garde. Segments are repeatable.

**SPN 272. Seminar in the Literature of a Specific Latin American Country (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. The in-depth study of the most important literary achievements of a single country such as Mexico, Argentina, Chile, or Peru, varying each time the course is offered. May be repeated for credit.

**SPN 273A. Literature and Culture of Colonial Latin America: The Colonial Period and Its Interpreters (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. A panoramic introduction to colonial literature from pre-Columbian times to the eighteenth century. Explores the major texts in their historical and literary contexts. Approaches specific passages from several theoretical perspectives. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SPN 273B. Literature and Culture of Colonial Latin America: Spain and the New World (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Examines the interrelationship between key Golden Age and Spanish colonial texts and modern Latin American narrative and essay. Explores issues of literary genealogy, cultural identity, and the reclamation of history. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SPN 273C. Literature and Culture of Colonial Latin America: Foundational Narratives of Latin America (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Examines how nar-

rative, history, and the formation of collective consciousness intertwine in Latin America. Considers various periods and their respective mythologies, especially creation myths, with an eye towards teasing out the foundational archetypes and master narratives. Also addresses the purposes of such myths and archetypes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SPN 275. Seminar in Literary Criticism (4)** Seminar, 3 hours. Prerequisite(s): graduate standing.

**SPN 277. Poetry and Translation (4)** Workshop, 3 hours; extra reading, 1.5 hours; outside research, 1.5 hours. Prerequisite(s): graduate standing; reading proficiency in Spanish. Discusses the efficacy and difficulty of translating poetry from the Spanish language into English. Explores the works of twentieth- and twenty-first century major Spanish language poets. Provides a forum to render and compare translations. Cross-listed with CWPA 276.

**SPN 278. Studies in Latin American Literature and Culture (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores a specific topic in Latin American literary and/or cultural studies. Topics vary. Course is repeatable as content changes.

**SPN 279. Studies in Spanish Literature and Culture (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores a specific topic in Spanish literary and/or cultural studies. Topics vary. Course is repeatable as topics change.

**SPN 290. Directed Studies (1-6)** Prerequisite(s): graduate standing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SPN 291. Individual Studies in Coordinated Areas (1-6)** variable hours. Prerequisite(s): graduate standing. A program of studies designed to advise and assist candidates who are preparing for examinations. Open to M.A. and Ph.D. candidates. Does not count toward the unit requirement for the M.A. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SPN 292. Concurrent Analytical Studies (2)** Outside research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in a SPN-100 series course. To be taken on an individual basis. Students complete a graduate paper based on research related to the SPN 100-series course. Course is repeatable as topics change. Neither SPN 105 nor the sequences SPN 101A and SPN 101B, SPN 106A and SPN 106B, and SPN 120A, SPN 120B, and LNST 120/SPN 120C may be used for SPN 292.

**SPN 299. Research for Thesis or Dissertation (1-12)** Prerequisite(s): graduate standing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**SPN 301. Teaching Spanish at the College Level (2)** Seminar, 2 hours. Prerequisite(s): graduate standing. Theories of language and language acquisition which underlie modern methods of Spanish language teaching at the college level. Practical experience in grading, test construction, lesson planning, teaching techniques, effective aspects of teaching, and creativity in teaching. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SPN 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in

Spanish. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Portuguese

### Lower-Division Course

**PORT 090. Special Studies (1-3)** Prerequisite(s): To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems. Course is repeatable.

### Upper-Division Courses

**PORT 101A. Intensive Brazilian Portuguese for Speakers of Spanish (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 101A or equivalent. An introduction to Brazilian Portuguese for students knowing Spanish. Emphasis is on comparing and contrasting grammatical constructions. Examples are taken from Brazilian literature.

**PORT 101B. Intensive Brazilian Portuguese for Speakers of Spanish (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): PORT 101A or equivalent. Continuation of PORT 101A. Covers advanced language through conversation, composition, and readings. **Megenney**

**PORT 101C. Intensive Brazilian Portuguese for Speakers of Spanish (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): PORT 101B or equivalent. Completes the study of structures of oral and written Portuguese, builds vocabulary, and hones the skills necessary to read Brazilian literature, discuss its content and importance, and write short essays explaining its nature.

**PORT 162 (E-Z). Survey in Brazilian Fiction (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PORT 101B or consent of instructor. Reading and analysis of selected works of major Brazilian prose writers. Topics may vary each time course is offered. E. Jorge Amado and Machado de Assis; F. Graciliano Ramos, Rego, Queiroz, Azevedo, Amado; G. Verissimo, Amado. Course to be taught in the original language.

**PORT 190. Special Studies (1-5)** variable hours. Prerequisite(s): consent of chair of the department. Course is repeatable.

**PORT 201. Brazilian Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. A survey of Brazilian literature from the colonial period to present, including chronicles, poetry, the short story, and the novel. Selected works from the several historical literary periods are read and analyzed. All readings and lectures are done in Portuguese; class discussion and examinations may be done in Portuguese, Spanish, or English.

**PORT 202. The Brazilian Novel (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Reading and discussion of selected Brazilian novels from the nineteenth and twentieth centuries, with emphasis on the most important authors (e.g., Joaquin Manuel de Macedo, Aluisio Azevedo, Machado de Assis). Reading and lectures are in Portuguese; class discussion is in Portuguese, Spanish, or English.

### Graduate Courses

**PORT 201. Brazilian Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate

standing. A survey of Brazilian literature from the colonial period to present, including chronicles, poetry, the short story, and the novel. Selected works from the several historical literary periods are read and analyzed. All readings and lectures are done in Portuguese; class discussion and examinations may be done in Portuguese, Spanish, or English.

**PORT 202. The Brazilian Novel (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Reading and discussion of selected Brazilian novels from the nineteenth and twentieth centuries, with emphasis on the most important authors (e.g., Joaquin Manuel de Macedo, Aluisio Azevedo, Machado de Assis). Reading and lectures are in Portuguese; class discussion is in Portuguese, Spanish, or English.

## History

**Subject abbreviations: HISA, HISE, HIST**  
**College of Humanities, Arts, and Social Sciences**

Thomas Cogswell, Ph.D., Chair Department Office, 1212 Humanities and Social Sciences (951) 827-5401; [history.ucr.edu](http://history.ucr.edu)

#### Professors

Catherine Allgor, Ph.D.  
James P. Brennan, Ph.D.  
Thomas Cogswell, Ph.D.  
V.P. Franklin, Ph.D. *President's Chair* (History/Education)  
Ann E. Goldberg, Ph.D.  
Piotr S. Górecki, Ph.D.  
Randolph C. Head, Ph.D.  
Ray A. Kea, Ph.D.  
Georg B. Michels, Ph.D.  
Robert W. Patch, Ph.D.  
Michele R. Salzman, Ph.D.  
Clifford E. Trafzer, Ph.D.  
*Rupert Costo Chair in American Indian Affairs*

#### Professors Emeriti

Kenneth D. Barkin, Ph.D.  
Carlos E. Cortés, Ph.D.  
Nathan G. Hale, Jr., Ph.D.  
Robert V. Hine, Jr., Ph.D.  
Dale V. Kent, Ph.D.  
Van L. Perkins, Ph.D.  
Roger L. Ransom, Ph.D.  
Norman Ravitch, Ph.D.  
Henry L. Snyder, Ph.D.  
P. Sterling Stuckey, Ph.D.  
Mack E. Thompson, Ph.D.  
Ronald C. Tobey, Ph.D.  
Irwin M. Wall, Ph.D.  
Charles Wetherell, Ph.D.

#### Associate Professors

Lynda S. Bell, Ph.D.  
David A. Biggs, Ph.D.  
Lucille Chia, Ph.D.  
Catherine Gudis, Ph.D.  
Steven W. Hackel, Ph.D.  
Rebecca Kugel, Ph.D.  
Juliette Levy, Ph.D.  
Brian D. Lloyd, Ph.D.  
Molly McGarry, Ph.D.  
Kiril Tomoff, Ph.D.  
Devra A. Weber, Ph.D.  
Fariba Zarinebaf, Ph.D.

#### Assistant Professors

Jonathan P. Eacott, Ph.D.  
Kendra T. Field, Ph.D.  
Alexander B. Haskell, Ph.D.  
Dana Simmons, Ph.D.

\*\*

#### Lecturer Emeritus

Robert B. Herschler, M.A.

#### Adjunct Professor

Larry E. Burgess, Ph.D.

## Majors

History plays a central role in general education for all undergraduate students. History stresses an understanding of changes that take place in society over time. It also provides a meaning to the past that has many implications for the future. Since we learn from experience, through history we can greatly broaden our learning through the experience of others, removed in time and distant in space from our immediate world. The study of history is as useful as it is fascinating. History majors develop an ability to communicate well, both orally and in writing, and the capacity to think clearly and analytically. Whatever one's goals, it makes good sense to include history in any degree program.

### History/Administrative Studies Major

The History/Administrative Studies major is designed to combine the discipline of History, with its emphasis on changes in society over time, with the study of administrative behavior, the development of public policy, and the tools of decision making. The addition of an Administrative Studies component provides History majors with analytical administrative skills as well as familiarity with the theories and policies of public administration. The concepts of organizational behavior and decision making, when combined with the perspectives provided through the History major, ought to be of particular value to those planning to enter careers in business; federal, state, or local levels of public or private administration; government work or to those planning to attend a professional school of administration or to those utilizing the major in a variety of positions in the public or private sector. (See also the Public History Program, which outlines public sector careers in History.)

### History/Law and Society Major

The History/Law and Society major is designed to offer students the opportunity to combine the study of history, with its emphasis on the changes over time in society, politics, the economy, and culture, with the study of legal and law-like relationships and institutions. The coherent series of courses included in this major ought to be of particular value to those intending to study law or to enter other graduate fields as well as to those planning professional careers in government, public administration, business, or other areas where the relationship between history and the law is of significance.

### Career Opportunities

Many students planning graduate work find history an excellent preparation for professional schools such as law and business administration. For those planning a legal career, a strong background in Western institutions and values

can be obtained in a variety of courses in the department. And, of course, a major in history prepares the student for graduate study in this field as well as a broad range of general careers in business, government work and foreign affairs that ask for written and verbal skills developed in the major.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The History Department offers B.A. degrees in History, History/Administrative Studies, and History/Law and Society.

**Change of Major** Students switching to the History, the History/Administrative Studies, or the History/Law and Society Major must have completed three History courses with a grade of "C" or better.

### History Major

To receive a B.A. degree in History, students must take 48 units (twelve courses). At least 8 units (two courses) must be at the lower-division level; at least 36 units (nine courses) must be at the upper-division level.

Majors must take:

1. At least one World History course and at least one other lower-division course
2. At least four courses in one of the following areas of concentration, including a seminar (HIST 191 [E-Z]):
  - Ancient and Medieval
  - Europe
  - United States
  - Latin America
  - Asia, Africa, and the Middle East

The seminar HIST 191 (E-Z) is required and must be taken in the student's area of concentration.
3. At least four courses in at least three other of the above fields.

Students who choose United States as their area of concentration are strongly advised to take HIST 017A, HIST 017B as preparation for upper-division courses in American history.

Lower-division courses taken elsewhere may be counted toward the lower-division requirement, and advance placement units earned in high school may count toward its fulfillment as well. Please consult with the academic advisors for further details.

Each History major is urged to consult with the academic advisors for quarterly advising and to meet with the Undergraduate Advisor at least one time each year. Appointments can be made through the academic advisors.

### History/Administrative Studies Major

The major requirements for the B.A. degree in History/Administrative Studies are as follows:

**History requirements** (48 units):

All requirements for the B.A. in History

**Administrative Studies requirements** (37 units)

1. Lower-division courses (17 units)
  - a) BUS 010, BUS 020
  - b) STAT 048 or equivalent (may be used to satisfy breadth requirements)
  - c) CS 008 (may be used to satisfy breadth requirements)
2. Upper-division requirements (20 units)
  - a) Two courses (8 units) from the list below:
    - (1) ECON 102 or ECON 104A or ECON 130 or ECON 162/BUS 162
    - (2) PSYC 140 or PSYC 142
    - (3) SOC 150 or SOC 151 or SOC 171
    - (4) POSC 181 or POSC 182 or POSC 183
    - (5) ANTH 127 or ANTH 131

These two courses must be outside the discipline of History and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.

b) A three-course track (12 units) in Business Administration courses from one of the following:

- (1) Organizations (General): BUS 100, BUS 107, BUS 176/SOC 176, BUS 158/ANTH 105, SOC 150, SOC 151
- (2) Human Resources Management/Labor Relations: BUS 100, BUS 107, BUS 152/ECON 152, BUS 153/ECON 153, BUS 155, BUS 157, PSYC 142
- (3) Business and Society: BUS 100, BUS 102, BUS 107, PHIL 116, POSC 182, POSC 186
- (4) Marketing: BUS 103, and two from BUS 112, BUS 113, BUS 114, BUS 117
- (5) Managerial Accounting/Taxation: BUS 108, and two from BUS 166, BUS 168A, BUS 168B
- (6) Financial Accounting: BUS 108, BUS 165A, BUS 165B
- (7) Finance: BUS 106/ECON 134 and two from BUS 134, BUS 136, BUS 137, BUS 138, BUS 139
- (8) Management Information Systems: BUS 101, BUS 171, BUS 173
- (9) Production Management: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

**Note** In filling the dual requirements of the selected major, students may not count more than two courses toward both parts of their

total requirements (History requirements and Administrative Studies requirements).

### History/Law and Society Major

The major requirements for the B.A. degree in History/Law and Society are as follows:

1. **History requirements** (48 units):
  - All requirements for the B.A. in History
2. **Law and Society requirements** (36 units)
  - a) PHIL 007 or PHIL 007H
  - b) LWSO 100
  - c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
  - d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
  - e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
  - f) LWSO 193, Senior Seminar

**Note** For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (History requirements and Law and Society requirements). The History courses that may fill the dual requirements include HISE 153 (History of the Common Law), and HISA 120A and HISA 120B (The Supreme Court and the Constitution).

### Minor

The History Department also offers a minor in History. In order to receive a minor, students must take 28 units (seven courses), including

1. At least one World History course and at least one other lower-division course.
2. At least three courses in one of the following areas of concentration:
  - Ancient and Medieval
  - Europe
  - United States
  - Latin America
  - Asia, Africa, and the Middle East
  - History of Science and Technology
3. At least two courses from two of the above fields, one in each.

Students who choose United States as their area of concentration are strongly advised to take HIST 017A, HIST 017B as preparation for upper-division courses in American history.

Lower-division courses taken elsewhere may be counted toward the lower-division requirement, and advance placement units earned in high school may count toward its fulfillment as well. Please consult with the academic advisors for further details.

Students undertaking a minor in History are urged to consult with the academic advisors for quarterly advising and meet with the undergraduate advisor at least once a year. Appointments can be made through the academic advisors.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Recommended Prelaw Courses

The History major has long been considered as an ideal major for students planning to study law since it meets the three goals that law schools recommend for undergraduate applicants:

1. That they achieve an understanding of the development of social, political, and economic institutions
2. That they develop an ability to communicate well, both orally and in writing
3. That they possess the capacity to think clearly and analytically.

The History Department especially recommends the following upper-division courses to prelaw students:

- HISE 150 (Ancient/Medieval England)
- HISE 153 (History of the Common Law)
- HISA 120A, HISA 120B (The Supreme Court and the Constitution)

## Education Abroad Program

EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental academic advisors for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

The Department of History offers the M.A. in History, the M.A. in History through the public history program, and the Ph.D. in History.

**Admission** The department accepts admissions applications from students intending to earn each of these degrees. Applications for admission to the graduate programs in History are normally accepted for the fall quarter only. Scores for the aptitude sections of the GRE are

required of all applicants, and applicants must submit a writing sample. Students entering the Ph.D. program without an M.A. may also earn the M.A. in History, as described below. Students admitted to one of the M.A. programs may later request admission to the Ph.D. program.

Entering students choose a faculty advisor, who works closely with the graduate advisor in approving the student's course of study. Detailed rules for each program are contained in the departmental protocols.

## Master's Degree

The Department of History offers three programs of study leading to the M.A. degree: the Regular Program (Plan I and Plan II) and the Public History Program.

### Regular Program (M.A.)

Students seeking the M.A. degree choose a field of specialization from the list below, and follow one of two plans:

**Plan I (Thesis)** Candidates must complete 40 units of required course work beyond the baccalaureate, 36 of which must be at the graduate level. The student's curriculum must include the following:

1. At least one course in historical theory and methods
2. At least one two-quarter research seminar, preferably in the student's area of specialization
3. At least 4 units in courses outside the student's area of specialization
4. Twelve (12) units of thesis preparation, HIST 299

The purpose of the additional required course work is to prepare the student for examinations, and should include relevant Materials and language requirement.

Students prepare a substantial M.A. thesis. Candidates must pass an oral examination discussing the thesis and future research agenda. The thesis and orals committee consists of three faculty members.

### Plan II (Comprehensive Examination)

Candidates must complete 40 units of required course work beyond the baccalaureate, 32 of which must be at the graduate level. The curriculum must include the following:

1. At least one course in historical theory and methods
2. At least one two-quarter research seminar, preferably in the student's area of specialization
3. At least 16 units in courses outside the student's area of specialization

The purpose of the additional required course work is to prepare the student for examinations, and should include relevant Materials and language requirement.

Candidates prepare a portfolio selected by the student and advisor, and must pass a compre-

hensive oral examination based on the submitted material. The examination committee consists of two faculty members.

### Areas of Specialization

1. United States
2. Native American
3. Ancient Mediterranean
4. European, with concentration in either Early Modern Europe, Modern Europe, Britain, or Russia
5. Latin American
6. Southeast Asia

**Language Requirement** Candidates must demonstrate an ability to read one foreign language.

### Public History Program (M.A.)

This program provides education in history as well as technical training for historical careers in archives, historic preservation, museums, and other positions in the public sector.

**Admission** Applicants must have either the B.A. in History or the baccalaureate in another field and be able to demonstrate a satisfactory knowledge of history.

Students prepare in three areas:

1. A historical field, in which the student is trained in academic research and historiography
2. A professional specialty: archival management, historic preservation, or museum curatorship
3. A subspecialty, consisting of courses related to the professional specialty

**Course Work** Candidates must complete a minimum of 40 units of courses as follows:

1. One two-quarter graduate history research seminar.
2. Two History courses chosen from HIST 200–250 and 254.
3. HIST 260, HIST 262, or HIST 263, chosen according to the student's subspecialty. The accompanying practicum must also be taken if offered.
4. Four upper-division undergraduate or graduate courses related to the subspecialty. Two should be outside the History department; additional courses outside the department require approval of the Public History advisor.
5. Four units of HIST 290 while writing the internship field report.

All students must also complete HIST 398-I and HIST 402, which do not count toward the 40-unit requirement.

**Internship** The candidate must complete a ten-week internship, coincident with an academic quarter or summer session, at a cooperating institution, for training under professional supervision in a field of the candidate's choice. The internship is registered with a History Department faculty advisor as HIST 398-I. The internship requires a written field report.

When the candidate's advisor and the Committee on Public History judge that an additional skill, particularly in the subspecialty, is needed, then

a defined level of competency in that skill is required for the degree.

**Oral Examination** Candidates must pass two-part oral examination: one part on the field-report-in-progress and a second part on the candidate's field of history and subspecialty.

**Normative Time to Degree** 6 quarters. M.A. students who wish to transfer to the Ph.D. program must apply for a sixth-quarter review as described in the Ph.D. program. No student may enroll in these M.A. programs for more than 9 quarters.

## Doctoral Degree

The Department of History offers the Ph.D. in History. The Ph.D. program in History prepares graduates for careers as university teachers, public historians, and professional researchers and analysts.

**Admission** Students may prepare for entry into the Ph.D. program by earning a B.A. or an M.A. degree in History or by earning a degree in a closely related field that involves significant study of history. Students holding a degree in another field are evaluated by the graduate studies committee on a case-by-case basis to determine the level of the graduate program at which they should commence their studies.

**Course Work** Candidates for the Ph.D. degree entering with a baccalaureate degree complete a minimum of 56 units of required course work, 44 of which must be at the graduate level. Students who enter with an M.A. degree complete a minimum of 28 units, 20 of which must be at the graduate level, and may be able to waive certain course requirements listed below. The student's curriculum during the entire graduate career must include the following:

1. At least two two-quarter graduate research seminars
2. At least two graduate-level courses in theory and methods
3. At least three Materials courses or equivalent courses, chosen from the student's fields
4. At least three courses approved by the graduate advisor for the teaching field requirement, of which two must be at the graduate level

All Ph.D. students must also complete HIST 301. Students whose research or complementary field is Public History must complete HIST 402. These courses do not count towards unit requirements.

Courses should be chosen in consultation with the student's faculty advisor and the graduate advisor; suitable courses are described in the departmental protocols. HIST 290 may be used towards the specific requirements above only with the permission of the graduate advisor.

**Ph.D. Fields** Students prepare three fields: a research field, a complementary field, and a teaching field. The research fields that the department offers are listed below; complementary and teaching fields may be chosen

from among the research fields or from the list of additional fields. In special cases, students may petition to replace the complementary field with a custom field designed by the student in consultation with two faculty members who agree to administer the written examination in the field. Students may not offer three fields that all deal with a single country or region.

### Research Fields:

Early America  
Nineteenth-Century United States  
Twentieth-Century United States  
American West  
Native American History  
Ancient Mediterranean  
Early Modern Europe  
Modern Europe  
Early Modern England  
Modern England  
Modern Russia  
Colonial Latin America  
Modern Latin America  
Southeast Asia  
Public History

### Additional Fields

Early Modern World History  
Modern World History  
Gender History

**Sixth-Quarter Review** All Ph.D. students undergo a comprehensive review no later than the sixth quarter of enrollment in the program, based on a portfolio selected by the student and advisor. The graduate studies committee reviews the student's record and makes one of the following recommendations: proceed, hold, or terminate. Students receiving a hold may reapply once, within three quarters. Students receiving a terminate may continue enrolling for no more than three quarters to complete MA requirements.

Only under extraordinary circumstances may a student continue enrolling for more than 9 quarters (including enrollment while an M.A. student at UCR) without permission to proceed to examinations.

## M.A. in History degree for Ph.D. Students

Students enrolled in the Ph.D. program may apply for the M.A. degree in History once they have completed the requirements for the degree.

### Requirements for completing the Ph.D. degree

**Examinations** Students are examined in their research and complementary fields by written examinations and at the Ph.D. oral examination. To take the Ph.D. oral qualifying examination, the student must submit a preliminary draft of the dissertation proposal. The teaching field is satisfied by course work.

**Language Requirement** Students must demonstrate reading proficiency in at least one language other than English. In certain research fields, students may be required to demonstrate a higher level of proficiency or to demonstrate proficiency in additional languages. Consult the departmental protocols for specific requirements.

**Candidacy** Students advance to candidacy after completing all examinations, the teaching field, and the language requirement. By the end of the following academic quarter, each student must submit to the graduate study committee a dissertation proposal approved by the student's faculty advisor.

**Dissertation** Candidates must submit a dissertation that demonstrates scholarly, original, and independent investigation of a subject in the student's research field chosen with the advice and approval of the dissertation committee.

**Normative Time to Degree** 17 quarters (including M.A. work).

# History

## Lower-Division Courses

*The History Department offers these lower-division courses for the benefit of the entire campus, not specifically for History majors. HIST 010, HIST 015, HIST 017A, HIST 017B, and HIST 020 are appropriate preparation for upper-division work in the department.*

**HIST 001. The Historian as Detective (4)** Lecture, 3 hours; discussion, 1 hour. Introduces several approaches to the methods and processes historians use to reach conclusions about the past. Provides the student with an opportunity to work creatively with historical materials and become the historian as detective. Topics vary and are listed in the *Schedule of Classes*. Course is repeatable as topics change.

**HIST 004. Introduction to Chicano History (4)** Lecture, 3 hours; extra reading, 3 hours. The historical heritage of the Chicano from Spanish and Indian origins to the Chicano movement, with emphasis on the period since 1845. Cross-listed with ETST 004.

**HIST 010. World History: Prehistory to 1500 (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A comparative introduction to the development of cultures in Europe, the Americas, Africa, and Asia. Topics covered are the origins of world civilizations; the classical world, or bronze age, from a global perspective; and the evolution of complex political systems throughout the medieval world. Includes a comparative discussion of world religions, West and East. Credit is awarded for only one of HIST 010 or HIST 010H.

**HIST 010H. Honors World History: Prehistory to 1500 (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to HIST 010. A comparative introduction to the development of cultures in Europe, the Americas, Africa, and Asia. Topics covered are the origins of world civilizations; the classical world, or bronze age, from a global perspective; and the evolution of complex political systems throughout the medieval world. Includes a comparative discussion of world religions, West and East. Satisfactory (S) or No

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Credit (NC) grading is not available. Credit is awarded for only one of HIST 010 or HIST 010H.

**HIST 015. World History: 1500 to 1900 (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none.

Emphasis on the unique characteristics of world cultures as they entered into a critical period of increasing interaction, a process that led to the shaping of the modern world order. Specific themes include religious, economic, and political revolution; the development of modern science; continuity and change in agrarian societies; industrialism; imperialism; and changes in the patterns of everyday life. Credit is awarded for only one of HIST 015 or HIST 015H.

**HIST 015H. Honors World History: 1500 to 1900 (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to HIST 015. Emphasis on the unique characteristics of world cultures as they entered into a critical period of increasing interaction, a process that led to the shaping of the modern world order. Specific themes include religious, economic, and political revolution; the development of modern science; continuity and change in agrarian societies; industrialism; imperialism; and changes in the patterns of everyday life. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of HIST 015 or HIST 015H.

**HIST 017A. Introduction to United States History (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the major themes and issues in the history of the United States from colonialization to the middle of the nineteenth century.

**HIST 017B. Introduction to United States History (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the major themes and issues in the history of the United States from the middle of the nineteenth century to the present.

**HIST 020. World History: Twentieth Century (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to world cultures, political systems, war, and revolution in the twentieth century. Topics include the rise and fall of the superpowers, colonization and decolonization, boom and bust, fascism and communism, world wars, and contemporary history. Credit is awarded for only one of HIST 020 or HIST 020H.

**HIST 020H. Honors World History: Twentieth Century (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to HIST 020. An introduction to world cultures, political systems, war, and revolution in the twentieth century. Topics include the rise and fall of the superpowers, colonization and decolonization, boom and bust, fascism and communism, world wars, and contemporary history. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of HIST 020 or HIST 020H.

**HIST 024. Ancient Israel and Its Near Eastern Context (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces biblical archaeology and its historical interpretation. Focuses on the Old Testament and its historical and cultural setting in the ancient Near East. Explores biblical and non-biblical literature (Canaanite, Sumerian, Babylonian, Assyrian) to illustrate further the contacts and interconnections among all the peoples of the ancient Near East.

**HIST 025. The Ancient Mediterranean (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): none. Surveys the political history of the ancient Mediterranean world from the Bronze Age (3000 B.C.)

to the beginning of the Common era. Focuses on the Near East (Sumer, Babylonia, Assyria, Egypt, Israel, Persia), Greece, and Rome. Provides a coherent background for advanced study in ancient Near Eastern, biblical, or classical history.

**HIST 026. Civilization before Greece and Rome (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): none. An introduction to the history of the ancient Near East, focusing on Mesopotamia and Egypt, but also including the Syro-Palestinian, Anatolian, and Aegean regions. Covers the history and culture of the world from circa 3000 to 300 B.C. that formed the backdrop to the Hebrew Bible and the Homeric epic tradition. Provides a background for further study of the ancient Mediterranean, Near Eastern, or biblical worlds.

**HIST 027. Rome: The Ancient City (4)**

Lecture, 3 hours; extra reading, 3 hours. Traces the development of the city of ancient Rome. By studying the literary and historical evidence alongside the physical remains of the city—its monuments, art, and historical and archaeological remains—this course seeks to introduce students to the Romans and to their importance for later ages. Cross-listed with AHS 030 and CLA 017.

**HIST 030. Themes and Personalities in History (4)**

Lecture, 3 hours; consultation, 1 hour. Enduring themes and great personalities in the history of man selected from Western and non-Western traditions. Concentration will be on particular subtopics to be announced in the *Schedule of Classes*. Course is repeatable as topics change to a maximum of 24 units.

**HIST 033. Witchcraft in Colonial America (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces the history of witchcraft beliefs and witch-hunting in colonial America. Explores witchcraft in its many dimensions: religious, cultural, psychological, political, legal, social, and economic. Students read original documents and study recent scholarly interpretations of early American events and attitudes.

**HIST 034. Introduction to Native American Culture and Religion (4)**

Lecture, 3 hours; discussion, 1 hour. Interdisciplinary study of contemporary and historic Native American efforts to resist colonialism, with a strong emphasis on land matters, identity issues, and religious forms. Promotes critical reflection on historic and contemporary culture and politics. Cross-listed with RLST 024.

**HIST 035. History of North American Indians, 1491-1799 (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines North American Indian history from 1491 through Handsome Lake's Revitalization Movement, highlighting the experiences of selected Native groups during the colonial era. Special attention is given to the importance of Native American perspectives of historical issues and events.

**HIST 036. History of North American Indians, 1800-1899 (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines North American Indian history during the nineteenth century from Jefferson's administration to McKinley's administration. Explores government policies, native agency, and the interface of multiple cultures. Emphasizes Native American historical interpretations.

**HIST 037. History of North American Indians, 1900-Present (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines North American Indian history during the twentieth century and early twenty-first century. Topics include allotment, the Indian New Deal, World War II, termination, self-determination, and tribal sovereignty. Students read original

documents, study new interpretations, and learn about contemporary Native people.

**HIST 038. The Maya from Ancient to Modern Times (4)**

Lecture, 3 hours; individual study, 3 hours. Examination of the Maya of Mexico, Guatemala, and Honduras from the rise of civilization to the present day. Topics to be discussed include the nature of Maya civilization; the Preclassic, Classic, and Postclassic Maya; the Spanish conquest; the Maya under Spanish colonialism; the impact of liberal policies in the nineteenth century; revolution and repression in the twentieth century. Videos and slides used to illustrate important themes and concepts.

**HIST 040. Literary Response to Disaster and Repression (5)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An examination of how literature (e.g., memoir, fiction, and poetry) can be utilized in the recovery from disaster or repression. Analyzes examples from Asia, Africa, and Europe to address the issues of looking squarely, coming to terms, commemoration, and apology. Cross-listed with CPLT 040. Credit is awarded for only one of CPLT 040/HIST 040 or CPLT 040W/HIST 040W.

**HIST 040W. Literary Response to Disaster and Repression (5)**

Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ENGL 001B with a grade of "C" or better or consent of instructor. Examines how literature is utilized in the recovery from major disaster or repression. Analyzes examples from Asia, Africa, and Europe that address the issues of looking squarely, coming to terms, commemoration, and apology. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better. Cross-listed with CPLT 040W. Credit is awarded for only one of CPLT 040/HIST 040 or CPLT 040W/HIST 040W.

**HIST 044. Gods, Ghosts, and Grandparents (4)**

Lecture, 3 hours; discussion, 1 hour. Considers some of the different ways the Chinese regarded—and still regard—gods, ghosts, and ancestors. Nearly all the readings are primary sources spanning almost four thousand years of Chinese history and include texts on oracle bones, philosophical arguments for and against the existence of spirits, tomb contracts for the dead, a sutra promoting the goddess Guanyin as Giver of Sons, ghost stories, and eyewitness accounts of funeral rituals. Cross-listed with RLST 044.

**HIST 045 (E-Z). Topics in Asian History (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): none. An introduction to regional histories and cultures of Asia. E. Premodern China and Japan; F. Contemporary China; G. India in the Western Imagination. Cross-listed with AST 045 (E-Z).

**HIST 046. Introduction to Southeast Asian History (4)**

Lecture, 3 hours; extra reading, 3 hours. Introduces major themes and events in Southeast Asian history. Covers from prehistory to contemporary events in the region. Develops basic historical approaches to understanding contemporary trends, such as the spread of world religions, regional differences and connections, trading patterns, cultural forms, and historically important sites. Cross-listed with AST 049 and SEAS 047.

**HIST 051. Europe from Plague to Revolution, 1400-1750 (4)**

Lecture, 3 hours; term paper, 3 hours. A survey of European history from the aftermath of the Black Death until the French Revolution. Introduces the geographic, demographic, and economic conditions underlying early modern European society, and examines cultural, political, and intellectual forms as they changed. Special attention is given to the histori-

cal experience of individuals, including commoners and elites.

**HIST 052. Europe from the Enlightenment to 1968 (4)** Lecture, 3 hours; extra reading, 3 hours. A survey of European history from the mid-eighteenth century to 1968. Focuses on the political and social revolutions in France and Russia, two world wars, and the consequences of rapid industrialization. Explains the emergence of a large middle class, the transformation of women's roles, and changing perceptions of the outside world.

**HIST 052S. Europe from the Enlightenment to 1968 (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. A survey of European history from the mid-eighteenth century to 1968. Focuses on the political and social revolutions in France and Russia, two world wars, and the consequences of rapid industrialization. Explains the emergence of a large middle class, transformation of women's roles, and changing perceptions of the outside world.

**HIST 060. Years of Protest: America, 1960-1975 (4)** Lecture, 3 hours; consultation, 1 hour. A close examination of the intellectual and cultural trends in the period from 1960-1975, with emphasis on the rise of the New Left, the Counterculture and the growing militancy of Blacks, Native Americans, Chicanos, and women.

**HIST 061. Martin Luther King, Jr (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001, HIST 060, or consent of instructor. A study of the life of Martin Luther King, Jr. with emphasis on the civil rights campaigns he led in the period, 1955-1968, and on the social and political philosophies he taught and espoused. Cross-listed with ETST 061.

**HIST 075. Introduction to Latin America (4)** Lecture, 3 hours; consultation, 1 hour. The historical heritage of Latin America from its Indian, Spanish, and African origins to the present, including the related Latino experience in the United States. Contemporary and historical themes will range from poverty, revolution, race relations, and imperialism to music, art, sports, popular culture, and social mores.

**HIST 099W. The Historian's Workshop (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): completion of ENGL 001B or equivalent. An introduction to the tools in the historian's workshop. Topics include historical sources, methods of analysis, and various approaches to historical narrative. Discusses historical research, analysis and writing through the study of exemplary historical works and through practice with original historical sources. Prepares students for upper-division History and humanities courses. This course fulfills the third quarter writing requirement for students who earn a grade "C" or better.

## Upper-Division Courses

**HIST 103. History of Science from Antiquity to Copernicus (4)** Lecture, 3 hours; outside research, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to ancient and medieval science focusing on the development of mathematical description of nature in astronomy. Secondly, the early histories of physics and mechanics as they relate to the history of astronomy are covered.

**HIST 104. The Scientific Revolution (4)** Lecture, 3 hours; online discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. History of the scientific revolution of the sixteenth and

seventeenth centuries from Copernicus through Newton, stressing the cultural interaction of science, philosophy, and religion, with secondary attention to the historical sociology of science.

**HIST 105. Science in the Modern World (4)** Lecture, 3 hours; online discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. History of science in the nineteenth and early twentieth centuries, stressing the rise of the Darwinian world view, the genetic revolution and its social consequences, and the romantic rejection of science.

**HIST 106. Science in Triumph and Crisis (4)** Lecture, 3 hours; online discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. History of science in the twentieth century with attention to the revolutions in physics and biology, the role of scientists in the world wars, the social responsibility debate, and the rise of the United States as a scientific power.

**HIST 107. Disease and Society (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers a world history of disease and how it relates to massive population change, cultural shocks, and globalization. Evaluates the complex and reciprocal relationship between illness and society. Analyzes how cultures, states, and individuals shape the spread of contagious disease, as well as how disease affects societies.

**HIST 108. Technology in Premodern Civilizations (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines relations between society, machine, and state in ancient China, Greece, Rome, and medieval Europe. Focuses on key mechanical and civil technologies and the role of the state in differentiating their development between the four historic civilizations. Cross-listed with ENGR 108.

**HIST 109. Technology in Modern Europe and America, 1700-Present (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the emergence of modern Europe through the first and second industrial revolutions in Europe and America. Explores the development of device commodities as the typical form of consumer technology in the nineteenth and twentieth centuries, as well as addresses philosophical issues in understanding technology. Cross-listed with ENGR 109.

**HIST 110. History of Ancient Astronomy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins and history of ancient astronomy from Mesopotamia to the Greco-Roman world. Topics include the problems of the calendar and planetary motion, and the relation between astronomy and astrology in the ancient world. Focuses on readings from primary texts. Cross-listed with CPAC 134.

**HIST 111. Public History and Community Voices (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the study of public history and the use of oral history, narratives, written sources, photographs, material culture, and other documentary evidence important to presenting historical information and interpretation to a large audience. Analysis of archives, museums, government agencies, familial sources, and other historical repositories that hold community voices. Students present public history by producing an exhibit, published work, or community project.

**HIST 121. Middle Eastern History, 1200 to 1800 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. Explores the history of the Middle East from 1200 to 1800. Includes the Mongol conquests, as well as the rise and expansion of the Ottoman empire.

**HIST 124. Women in Middle Eastern and Islamic History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. Explores the history of women in the Middle East from the medieval to the modern period. Focuses on the legal status of women, their social and economic position, the rise and development of the feminist movement, and the impact of various Islamist movements.

**HIST 125. Islam and Revolution in Iran (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the historical background to the Iranian revolution of 1978-1979. Offers a critical assessment of the existing scholarship. Includes the rise of Shi'ism as Iran's state religion; the relationship between religion, state, and society; and the role of Shi'i Islam versus other ideologies with social movements.

**HIST 126. Istanbul in History and Fiction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores urbanization in Middle Eastern and Ottoman history. Includes the history of Istanbul from the Ottoman conquest to the end of that empire. Addresses questions of urban transformation, imperial cities, Islamization, urban institutions, cosmopolitanism, and modernity.

**HIST 127. Israel: The Jewish State (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines Zionism and the state of Israel in the period from the first Zionist Congress in 1896 to the present. Addresses religious, social, economic, and political aspects of the Jewish state. Cross-listed with RLST 126.

**HIST 130A. History of Christianity: Origins to the Reformation (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Surveys the history of Christianity from its origins through the Reformation. Includes the development of Christian beliefs, practices, and institutions in historical contexts. Cross-listed with RLST 135A.

**HIST 130B. History of Christianity: Modern Era (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Surveys the history of Christianity since 1500. Emphasizes the Christianization of Asia, Africa, and the Americas in the long colonial era. Follows developments in Christian belief, practice, and institutions up to the present. Topics include Reformation, mission, colonialism, empire, conversion, syncretism, modernity, Vatican II, and the rise of evangelical Christianity. Cross-listed with RLST 135B.

**HIST 137 (E-Z). Themes and Topics in African History (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A thematic and topical approach to the study of African history from the early Nile Valley civilizations to the twentieth century. Examines the temporal and spatial development of African societies—including their social, political, economic, and ideological systems—during the precolonial, colonial, and postcolonial periods. F. West African History to 1800; I. Nineteenth- and Twentieth-Century Africa and European Imperialism; J. Ancient Africa; K. Africa from 1000-1880; M. Twentieth-Century Africa. Cross-listed with ETST 117 (E-Z).

**HIST 151. Interpreting World History (4)** Lecture, 3 hours; term paper, 3 hours, or peer mentoring, 3-5 hours, or school mentoring, 3-5 hours. Prerequisite(s): HIST 010 or HIST 010H (may be taken concurrently), HIST 015 or HIST 015H (may be taken concurrently), HIST 020 or HIST 020H (may be taken concurrently). Covers approaches to interpreting human history on a global scale. Topics include units of analysis, periodization, teleology, source constraints and the impact of modern perspectives. Students may apply course concepts through peer mentoring, presentation in Riverside schools, or a research project.

**HIST 180. Early Traditional China (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; at least one lower-division history course recommended. The history of China from Neolithic times to the end of the Tang Dynasty (early tenth century, C.E.) with emphasis on social, economic, and political history.

**HIST 181. Late Traditional China (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 180 strongly recommended. A survey of Chinese history from the tenth century to the early nineteenth century, covering the Song, Yuan, Ming, and part of the Qing dynasties. Emphasis on social, economic, and political history.

**HIST 182. Modern China (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 180 and HIST 181 are recommended. Examines the history of China from the Opium War to the early Communist period (1842-1960). The emphasis is on reaction to the Western impact and modernization.

**HIST 184. The Vietnam Wars (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Vietnamese history in the twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-*doi moi* society. Cross-listed with AST 160, SEAS 184, and VNM 184.

**HIST 185. Southeast Asia, Prehistory to 1800 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers the major Southeast Asian historical periods and cultures. Includes prehistory, classical kingdoms, and early modern trading states. Considers the role of ancient stories, religious systems, technologies, and art forms in forming traditional Southeast Asian identities, as well as the influences on these identities from outside the region. Cross-listed with AST 126 and SEAS 185.

**HIST 186. Modern Southeast Asia, 1800 to Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the formation of modern Southeast Asian nations and cultures since 1800. Compares colonial and postcolonial experiences in the region. Studies the formation of nationalist movements and the relationship of nationalist history with traditional and local histories. Considers the role of the individual, modern media, and global trade in the near-present. Cross-listed with AST 129 and SEAS 186.

**HIST 187. Vietnamese Literary History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of

Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with AST 162, SEAS 162, and VNM 162.

**HIST 188 (E-Z). Topics in Chinese History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing; HIST 180 or HIST 181 or HIST 182; or consent of instructor. An in-depth look at important topics in Chinese history. E. Chinese Food Culture; F. Four Great Inventions of Imperial China. Cross-listed with AST 188 (E-Z).

**HIST 189. Encountering Vietnam (5)** Lecture, 6 hours; tutorial, 6 hours; project, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on literary and historical accounts of Vietnam. Utilizes translated travel writings from different genres and eras. Proficiency in Vietnamese not required. Taught in Vietnam and offered only in summer. Cross-listed with AST 189, SEAS 189, and VNM 189.

**HIST 190. Special Studies (1-5)** To be taken with the consent of the chair of the department to meet special curricular problems. Course is repeatable to a maximum of 16 units.

**HIST 191 (E-Z). Seminar in History (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or upper-division course in the period or subject matter of the topic, or consent of instructor. Requires a substantial research paper or project, the result of carefully guided independent work (students may continue and expand papers or projects into a quarter of directed research by enrolling in HIST 199). E. Medieval History; F. Renaissance and Reformation; G. Seventeenth- and Eighteenth-Century Europe; I. Nineteenth-Century Europe; J. Nineteenth- and Twentieth-Century England; K. Twentieth-Century Europe; L. Modern Russia; M. European Thought and Culture; N. Mexican Migration to the United States; P. Colonial American History; Q. Nineteenth-Century American History; R. The American West; S. Twentieth-Century American History; T. American Thought and Culture; U. Colonial and Nineteenth-Century Latin America; V. Recent Latin America; W. Chinese History; X. Mass Media; Y. African History; Z. Ancient History.

**HIST 198-I. Individual Internship in History (1-12)** laboratory, 4-36 hours. Prerequisite(s): consent of instructor and upper-division standing. Individual interns will learn about the policies and operations, present and past, of cooperating agencies, such as museums, archives, professional associations, clinics, hospitals, churches, businesses. Students will become familiar with the on-going operations of these organizations and will research and write their histories under faculty supervision. Course is repeatable to a maximum of 16 units.

**HIST 199. Senior Research (1-4)** Outside research, 3-12 hours. Prerequisite(s): a segment of HIST 191 (E-Z); not open to students in the University Honors Program. The student works individually with the instructor to continue and expand a research paper or project begun in a HIST 191 (E-Z) segment. Course is repeatable to a maximum of 8 units.

**HIST 199H. Senior Honors Research (1-5)** Outside research, 3-15 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Offers the opportunity for directed research at an honors level. Satisfactory (S) or No Credit (NC) grading is not available.

## Graduate Courses

*Consent of the instructor is required for enrollment in all graduate courses.*

**HIST 200. General Colloquium in European History (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces advanced study of major themes and areas in British, European, and Russian history. Concentrates on recent scholarship illustrating current methods and questions in European history. Covers all three major geographical areas, although emphasis may vary. Course is repeatable to a maximum of 8 units.

**HIST 201A. Materials for American History: Colonial North America (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores colonial North American history as presented by primary and secondary sources. Course is repeatable as content changes to a maximum of 12 units.

**HIST 201B. Materials for American History: United States, 1789-1877 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores American history from 1789 to 1877 as presented by primary and secondary sources. Course is repeatable as content changes to a maximum of 12 units.

**HIST 201C. Materials for American History: United States, 1877 to the Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores American history from 1877 to the present as presented by primary and secondary sources. Course is repeatable as content changes to a maximum of 12 units.

**HIST 202A. Materials for European History: Early Modern Europe (1400-1789) (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores European history from 1400 to 1789 as presented through primary and secondary literature. Course is repeatable as content changes to a maximum of 12 units.

**HIST 202B. Materials for European History: 1789-Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores European history from 1789 to the present as presented through primary and secondary literature. Course is repeatable as content changes to a maximum of 12 units.

**HIST 203A. Materials for Native American History: Early America, Fifteenth through Eighteenth Centuries (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the theoretical approaches, central historical problems, and historiographical debates related to the study of Native American history. Covers the fifteenth through the eighteenth centuries. Course is repeatable as content changes to a maximum of 12 units.

**HIST 203B. Materials for Native American History: Nineteenth Century (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the theoretical approaches, central historical problems, and historiographical debates related to the study of nineteenth-century Native American history. Course is repeatable as content changes to a maximum of 12 units.

**HIST 203C. Materials for Native American History: Twentieth Century (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the theoretical approaches, central historical problems, and historiographical debates related to the study of twentieth-century Native American history. Course is repeatable as content changes to a maximum of 12 units.

**HIST 204. Materials for Modern French and Latin European History (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides readings in secondary literature on the history of France since the 1789 revolution. Also explores selected themes related to the histories of Italy and Spain. Course is repeatable as content changes to a maximum of 12 units.

**HIST 205A. Materials for English History: 1485-1820 (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): consent of instructor. An examination of selected primary materials related to English history. Also includes assessment of secondary accounts. Course is repeatable as content changes to a maximum of 12 units.

**HIST 205B. Materials for English History: 1760 to the Present (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): consent of instructor. An examination of selected primary materials related to English history. Also includes assessment of secondary accounts. Course is repeatable as content changes to a maximum of 12 units.

**HIST 206A. Materials for Latin American History: Colonial Period to 1820 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores Colonial Latin American history as presented by primary and secondary sources. Course is repeatable as content changes to a maximum of 12 units.

**HIST 206B. Materials for Latin American History: 1820 to the Present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores Latin American history from 1820 to the present as presented by primary and secondary sources. Course is repeatable as content changes to a maximum of 12 units.

**HIST 207A. Materials for the Early Modern World (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the major concepts, categories, methodological approaches, and historiographical issues in recent scholarship on the early modern world (circa 1400-1750). Focuses on interregional and interdisciplinary analysis. Course is repeatable as content changes to a maximum of 12 units.

**HIST 207B. Materials for the Modern World (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the major concepts, categories, methodological approaches, and historiography in recent scholarship on the modern world (circa 1800 to the present). Focuses on interregional and interdisciplinary analysis. Course is repeatable as content changes to a maximum of 12 units.

**HIST 209A. Materials for Modern Russia: 1801 to 1917 (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the historiography of Russian history. Topics include social development, cultural and religious history, peasants, industrialization, revolutionary movements, Bolshevism, ideology, and the Russian Civil War. Course is repeatable as content changes to a maximum of 12 units.

**HIST 209B. Materials for Modern Russia: Soviet History (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the historiography of Russian history. Topics include social development, cultural and religious history, Stalinism, World War II, and the post-Stalinist period. Course is repeatable as content changes to a maximum of 12 units.

**HIST 210. Introduction to Economic History (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Analysis of selected problems on economic history with an emphasis on methodological approaches to those issues.

**HIST 211. Materials for the Roman Empire (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the theories and practices of recent research into key issues of the history of Rome. Covers the late Republic and continues into the high empire. Introduces students to the key historiographic texts, as well as the primary ancient sources relevant to key topics in Roman history. Course is repeatable as content changes to a maximum of 12 units.

**HIST 215 (E-Z). Topics in American History (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Analysis of selected specific topics in American history. E. Slave Folklore and the Historical Process; F. Culture and Politics in Twentieth-Century United States; G. Transnational Migrations; I. Populism, the Progressive Movement, and the New Deal; J. The World of *Little Women*; K. History of Workers and Workers' Organizations in the United States.

**HIST 216 (E-Z). Themes in the History of the Americas (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Addresses intranational and international histories of the countries and peoples of the Americas. E. Mexican Cross-Border Labor, Organizing, and Internationalism, 1900-1975; F. Borders and Borderlands.

**HIST 217 (E-Z). Topics in Asian History (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing and consent of instructor. An introduction to a set of major research monographs in Asian history. E. Agrarian China from the Ming Dynasty to the Present.

**HIST 218. Africa in the Era of the Transatlantic Slave Trade (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the political economies and the social and cultural histories of Atlantic Africa between 1500 and 1800 within the wider framework of the Atlantic world. Emphasis is on methodological and theoretical issues and questions. Readings are based on primary historical sources as well as on recent research in the field.

**HIST 220. Approaches to Women's History (4)** Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An exploration of the major methodological and historiographical issues in women's history. It will focus primarily, but not exclusively, on women in the United States.

**HIST 221. Approaches to the Hellenistic World, East and West (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the Hellenistic age as it took shape in the Eastern and Western Mediterranean. Examines how new currents of thought merged with preexisting institutions. Topics include political, social, religious, and intellectual developments.

**HIST 222. Materials for Late Antiquity (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the central historiographical debates in the field of Late Antiquity. Course is repeatable as content changes to a maximum of 12 units.

**HIST 223. Approaches to Early Medieval History (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of

instructor. Introduces students to advanced scholarship in selected areas of early medieval historiography. Students focus on independent historiographical research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**HIST 224. Approaches to Later Medieval History (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to advanced scholarship in selected areas of later medieval historiography. Students focus on independent historiographical research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**HIST 225A. Seminar in Ancient and Medieval History (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines a historical theme or issue in ancient and medieval history. Includes readings in primary sources and analysis of research methods. First of a two-quarter sequence in which students begin work on a major research paper. Graded In Progress (IP) until HIST 225A and HIST 225B are completed, at which time a final grade is assigned. After completing both HIST 225A and HIST 225B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 225B. Seminar in Ancient and Medieval History (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 225A. Examines a historical theme or issue in ancient and medieval history. Includes readings in primary sources and analysis of research methods. Second of a two-quarter sequence in which students complete a major research paper. After completing both HIST 225A and HIST 225B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 226 (E-Z). Special Topics in Latin American History (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): HIST 206A or HIST 206B or consent of instructor. Analysis of selected specific topics in Latin American History. E. Latin American Social and Economic History; F. Race and Ethnicity in Latin America; G. Women in Latin America; I. Politics and the Formation of Nation States; J. History of the Latin American Family; K. Immigration, Emigration, and Migration; M. Mass Media in Latin America; N. U.S.-Latin American Relations; O. Nationalism, Liberalism, and Socialism in Latin America: the Southern Cone, 1880-1980; Q. Slavery and Slave Society in Nineteenth-Century Latin America.

**HIST 229. The American Other: Apparitions and Appropriations (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Cultural studies of the uncanny in American history in relation to race, gender, and colonialism.

**HIST 230. The American Frontier: Ideas and Interpretations (4)** Lecture, 3 hours; consultation and extra reading, 3 hours. Prerequisite(s): HISA 137. The broad themes and historical interpretations regarding the frontier as a factor in the American character and in American institutions.

**HIST 237. Theory and the Study of Native American History (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of salient theoretical issues raised by Native American history. Critiques theoretical approaches and assumptions currently shaping Native American history and assays the potential contributions to Native American history of theoretical approaches developed in other fields of concentration.

**HIST 238A. Oral History Methods and Theory (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A study of oral history methods, theory, and practice. Students discuss readings and develop oral history projects and questions. Course is repeatable to a maximum of 8 units.

**HIST 238B. Oral History Methods and Theory (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 238A. A study of oral history methods, theory, and practice. Students conduct interviews, transcribe, and produce a paper which utilizes the oral history interviews. Includes discussion of final interviews, transcripts, analysis, and paper of each student. Course is repeatable to a maximum of 8 units.

**HIST 240 (E-Z). Documentary Source Study (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the scholarly handling of texts, including inscriptions, manuscripts, archival documents, and electronic material. Instruction in methodologies, tools, sources, and in the editing and use of texts in history. Analysis of archival structure and organization, and of textual authorship, provenance, paleography, language, internal structure, and variants. E. Russian; F. Early Modern Europe. Each segment is repeatable to a maximum of 12 units.

**HIST 242. Approaches to Southeast Asian History (4)**

Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to central historical problems, historiographical debates, materials, and theoretical approaches in Southeast Asian history. Readings each week focus on a different theme. Course is repeatable to a maximum of 8 units. Cross-listed with SEAS 204.

**HIST 243A. Seminar in Southeast Asian History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses Southeast Asian topics from regional, comparative, and local perspectives. May be undertaken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned. After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with SEAS 243A.

**HIST 243B. Seminar in Southeast Asian History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 243A/SEAS 243A. Discusses Southeast Asian topics from regional, comparative, and local perspectives. Students produce a substantial research paper that continues their work from HIST 243A/SEAS 243A. May be undertaken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with SEAS 243B.

**HIST 250. New Directions in Historical Research (4)**

Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Frontiers of research in major historical periods. The coordinator and guest professors will discuss the methods and kinds of research which are most fruitful in his or her particular specialty.

**HIST 251A. General Seminar in European History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Seminar in European history, including continental European, British, and Russian history, intended primarily for M.A. students. Includes readings in archival and research methods, and in a shared research theme. Students complete a major research paper based on extensive use of primary source material. Graded In Progress (IP) until HIST 251A and HIST 251B are completed, at which time a final grade is assigned. After completing both HIST 251A and HIST 251B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 251B. General Seminar in European History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 251A. Seminar in European history, including continental European, British, and Russian history, intended primarily for M.A. students. Includes readings in archival and research methods, and in a shared research theme. Students complete a major research paper based on extensive use of primary source material. After completing both HIST 251A and HIST 251B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 252. Materials Supplement (4)**

Seminar, 3 hours. Prerequisite(s): any course in 201-206 series. Designed as a supplement to program of readings covered in materials courses; additional works are to be drawn from reading lists for M.A. comprehensive examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**HIST 253A. Seminar in Renaissance and Reformation History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers primary and secondary literature related to Renaissance and Reformation history. First of a two-quarter sequence in which students begin work on a research paper. Graded In Progress (IP) until HIST 253A and HIST 253B are completed, at which time a final grade is assigned. After completing both HIST 253A and HIST 253B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 253B. Seminar in Renaissance and Reformation History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 253A. Second of a two-quarter sequence in which students complete a research paper on Renaissance and Reformation history. After completing both HIST 253A and HIST 253B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 254. Theory and Methods in History (4)**

Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; consent of instructor; consent of advisor if repeating the course. Studies the evolution of the discipline of history by exploring theories, philosophies, and methods that are used in historical explanation. Concentrates on how some particular body of theory has influenced the writing of history. Course is repeatable to a maximum of 12 units as topics change.

**HIST 255A. Seminar in Modern Russia (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): UC Riverside graduate standing; consent of one of the UC Riverside instructors. A research seminar on modern Russian history (1801 to present). Covers appropriate primary sources and secondary literature. Topics include, but are not limited to, social history, labor,

ideology, politics, and revolutions from the Imperial and/or Soviet periods. An intercampus course taught jointly by faculty from UC Riverside, Irvine, San Diego, and Los Angeles. Graded In Progress (IP) until HIST 255A and HIST 255B are completed, at which time a final grade is assigned. After completing both HIST 255A and HIST 255B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 255B. Seminar in Modern Russia (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): UC Riverside graduate standing; consent of one of the UC Riverside instructors; HIST 255A. A research seminar on modern Russian history (1801 to present). Covers completion of research paper begun in HIST 255A. Topics include, but are not limited to, social history, labor, ideology, politics, and revolutions from the Imperial and/or Soviet periods. An intercampus course taught jointly by faculty from UC Riverside, Irvine, San Diego, and Los Angeles. After completing both HIST 255A and HIST 255B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 256A. Seminar in English History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing; HISE 151, HISE 152, or equivalents. A seminar on seventeenth- and eighteenth-century English history with primary emphasis on the historical literature within the field. Covers appropriate primary sources and secondary literature. Graded In Progress (IP) until HIST 256A and HIST 256B are completed, at which time a final grade is assigned. After completing both HIST 256A and HIST 256B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 256B. Seminar in English History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing; HISE 151, HISE 152, or equivalents; HIST 256A. A seminar on seventeenth- and eighteenth-century English history with primary emphasis on the historical literature within the field. Students complete a research paper. After completing both HIST 256A and HIST 256B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 258A. Seminar in Modern European History (4)**

Seminar, 3 hours. Graded In Progress (IP) until HIST 258B is completed, at which time a final grade is assigned. Course is repeatable to a maximum of 8 units.

**HIST 258B. Seminar in Modern European History (4)**

Seminar, 3 hours. Course is repeatable to a maximum of 8 units.

**HIST 260. Historic Preservation (4)** Seminar, 3 hours; conference, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Public policy and instruments of historic preservation in the urban setting.

**HIST 260L. Preservation Conservation Practicum (2)**

Research, 6 hours. Prerequisite(s): HIST 260, and/or HIST 261. Supervised training in the National Register nomination process and in development of the conservation management plan, with independent research projects in either conservation or preservation.

**HIST 261. Conservation Science and Historical Objects (4)**

Seminar, 3 hours; laboratory, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Principles and methods of conservation science related to historical artifacts; introduction to conservation practice in selected categories of objects; seminar and laboratory.

**HIST 262. Museum Research and Interpretation (4)**

Seminar, 3 hours; consultation, 1 hour.

Prerequisite(s): graduate standing or consent of instructor. Principles and methods of historical research in material culture; museum interpretation of artifacts; general orientation to the role of the historical curator.

**HIST 262L. Museum Interpretation Practicum (2)**

Outside research, 2 hours. Prerequisite(s): concurrent enrollment in HIST 262. Supervised research and interpretation in a museum; intended to accompany HIST 262.

**HIST 263. Archival Management (4)** Seminar, 3 hours; research, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Theory and practice of archival management; history of archives; professional ethics.

**HIST 263L. Archival Management Practicum (3)**

Research, 3 hours. Prerequisite(s): HIST 263. Supervised research and administrative experience in an archive; intended to follow HIST 263.

**HIST 264. Materials for Public History (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to primary materials for public history and its central historical problems and historiography. Also discusses debates within the field. Course is repeatable as content changes to a maximum of 12 units.

**HIST 265A. Seminar in Public History (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on themes affecting the management of archives, museums, cultural resources, and historic preservation. Students study sources and documents and present findings through an original research paper or museum, archival, or preservation project. First of a two-quarter sequence. Graded In Progress (IP) until HIST 265A and HIST 265B are completed, at which time a final grade is assigned. After completing both HIST 265A and HIST 265B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 265B. Seminar in Public History (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on themes affecting the management of archives, museums, cultural resources, and historic preservation. Students study sources and documents and present findings through an original research paper or museum, archival, or preservation project. Second of a two-quarter sequence. After completing both HIST 265A and HIST 265B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 272A. Seminar in American Colonial and Early National History (4)** Seminar, 3 hours. Graded In Progress (IP) until all terms are completed, when a final grade will be assigned. Course is repeatable to a maximum of 8 units.

**HIST 272B. Seminar in American Colonial and Early National History (4)** Seminar, 3 hours. Course is repeatable to a maximum of 8 units.

**HIST 273A. Seminar in the American West (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A research seminar focusing on themes in the study of the American West from the colonial era to the present, including migration, expansion, and modern urban development. Includes historical interpretations, readings, discussions, and research. Students begin a paper based on archival research, oral history, and material culture. Graded In Progress (IP) until HIST 237A and HIST 273B are completed, at which time a final grade is assigned. After completing both HIST 273A and HIST 273B, students may

repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 273B. Seminar in the American West (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 273A. A research seminar focusing on themes in the study of the American West from the colonial era to the present, including migration, expansion, and modern urban development. Includes historical interpretations, readings, discussions, and research. Students complete a paper based on archival research, oral history, and material culture. After completing both HIST 273A and HIST 273B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 274A. Seminar in Nineteenth-Century United States History (4)**

Seminar, 3 hours. Graded In Progress (IP) until HIST 274A and HIST 274B are completed, at which time a final grade is assigned. Course is repeatable to a maximum of 8 units.

**HIST 274B. Seminar in Nineteenth-Century United States History (4)**

Seminar, 3 hours. Course is repeatable to a maximum of 8 units.

**HIST 275A. Seminar in Twentieth-Century United States History (4)**

Seminar, 3 hours. Graded In Progress (IP) until HIST 275A and HIST 275B are completed, at which time a final grade is assigned. Course is repeatable to a maximum of 8 units.

**HIST 275B. Seminar in Twentieth-Century United States History (4)**

Seminar, 3 hours. Course is repeatable to a maximum of 8 units.

**HIST 276A. Seminar in Native American History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of Native American historical research, exploring philosophy, methodology, historiography, and sources relative to American Indians. Students study a variety of sources and documents, compile an annotated bibliography, conceptualize and design a research project, and begin work on an original historical paper. Graded In Progress (IP) until HIST 276A and HIST 276B are completed, at which time a final grade is assigned. After completing both HIST 276A and HIST 276B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 276B. Seminar in Native American History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 276A. A continuation of HIST 276A. Students conduct research on the topics selected in HIST 276A. Additional readings may be assigned at the discretion of the instructor. At the term's end, students present their findings through an original historical research paper. Instructors may also assign oral presentations of research findings. After completing both HIST 276A and HIST 276B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 277. Approaches to Early Modern World History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Study of selected historical themes, such as labor, gender, migration, cultural contact, and colonial systems, in an early modern context. Focuses on regional studies and issues of global connection in the early modern period. Intensive discussions of current scholarship in the given field. Course is repeatable to a maximum of 12 units with consent of advisor.

**HIST 285A. Seminar in Latin American History (4)**

Seminar, 3 hours; research, 3 hours. Graded In Progress (IP) until both terms are completed, when a

final letter grade will be assigned. Course is repeatable to a maximum of 8 units.

**HIST 285B. Seminar in Latin American History (4)**

Seminar, 3 hours; research, 3 hours. Course is repeatable to a maximum of 8 units.

**HIST 287A. Seminar in Nature, Place, and Space: Environmental and Spatial Approaches to History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys historical literature and methodologies involved in spatial and environmental analyses of the past, examines technical and methodological issues involved in using spatial documents (maps), and discusses applications of historical research to environmental remediation. Students work on a research paper. May be undertaken as a one- or two-quarter course (HIST 287A, HIST 287B). Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned. After completing both HIST 287A and HIST 287B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

**HIST 287B. Seminar in Nature, Place, and Space: Environmental and Spatial Approaches to History (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 287A. Surveys historical literature and methodologies involved in spatial and environmental analyses of the past, examines technical and methodological issues involved in using spatial documents (maps), and discusses applications of historical research to environmental remediation. Students discuss and critique each other's research. After completing both HIST 287A and HIST 287B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Course is repeatable to a maximum of 8 units.

**HIST 290. Directed Studies (1-6)** Prerequisite(s): consent of the chair of the department. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**HIST 291. Individual Study in History (1-12)** A program of study designed to advise and assist graduate candidates who are preparing for examinations. Does not count toward the unit requirement for the master's degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**HIST 292. Concurrent Analytical Studies (1-4)** Outside research, 3-12 hours. Prerequisite(s): consent of instructor. Taken concurrently with some 100-series course, but on an individual basis. Devoted to completion of a graduate paper based on research or criticism related to the 100-series course, the program of study is worked out with the instructor. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**HIST 297. Directed Research (1-6)** Prerequisite(s): consent of instructor. Individualized graduate student research under the sponsorship of specific faculty members, in topics other than the student's dissertation. Graded Satisfactory (S) or No Credit (NC). May be repeated for up to 8 units.

**HIST 299. Research for Thesis or Dissertation (1-12)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**HIST 301. The Teaching of History at the College Level (4)**

Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Normally required of all doctoral candidates and teaching assistants in

the department; open to terminal M.A. students with consent of instructor. Credit not applicable to graduate unit requirements. Graded Satisfactory (S) or No Credit (NC).

**HIST 302. Teaching Practicum (1-4)** Clinic, 1-4 hours; seminar, 1 hour. Prerequisite(s): limited to departmental teaching assistants; graduate standing. Supervised teaching in upper- and lower-division history courses. Required of all History teaching assistants. Fulfills teaching portion of Ph.D. teaching requirement. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**HIST 398-I. Internship in Public History (8-12)** Outside research, 8-12 hours; internship, 16-24 hours. Prerequisite(s): consent of program coordinator. An internship at a museum, archive, gallery, or other cooperating institution under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

**HIST 402. Professional Practice for the Public Historian (2)** Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing. Case study approach to the practice, professional codes, and ethics of public historians, including problems in conflict of interest, fee services, political advocacy, expert legal testimony, civil service, conflict with other professions (e.g., architecture), bidding procedures, and proprietary rights.

## History of the Americas

### Upper-Division Courses

**HISA 110A. Colonial America (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An exploration of early American society from settlement through the mid-eighteenth century. Topics include the convergence of Native American, European, and African cultures; the origins of slavery; religious diversity; and the growth and development of the colonies.

**HISA 110B. Revolutionary America (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of the political, social, and cultural movements that led to the American revolution and the formation of the Republic. Topics include crowd activity, imperial conflict, and the creation of the constitution.

**HISA 110C. The Early Republic: The United States, 1789-1848 (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes social, economic, political, and intellectual forces that transformed the United States from a fledgling preindustrial nation into a sprawling, exuberant, capitalist society. Topics include industrialism, capitalism, Christianity, democratic politics, slavery and racial structures, abolitionism, and American radicalism and nationalism.

**HISA 113. Slavery and the Old South (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An investigation of slavery in the antebellum South. Topics include: the emergence of the self-conscious South, the romanticized plantation, American historians and slavery, etc.

**HISA 114. The American Civil War (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of the American Civil War. Topics will include: Slavery as a cause of the war, the impact of emancipation and of the war on both North and South.

**HISA 115. Reconstruction (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Major leaders and events of post-Civil War America, with emphasis upon Reconstruction, racial and political conflict, industrial growth, and other historical developments that helped shape the modern South and the expanding nation.

**HISA 116. The United States, 1877-1914 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of political, social, economic, and cultural developments in the United States between the end of Reconstruction and the beginning of World War I.

**HISA 117A. United States, 1914 to 1945 (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the emergence of the United States as a global power, the second industrial revolution, the development of a consumer culture, and the creation of a regulatory state.

**HISA 117B. United States, 1945 to the Present (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the Cold War, the political and cultural consequences of post-World War II affluence, the social movements of the 1960s, Vietnam, and the conservative resurgence of the 1970s and 1980s.

**HISA 119. Modern U.S. Consumer Culture (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the history and culture of mass consumerism in the United States. Topics include the shift from mass production to mass consumption; the growth of advertising and product marketing; the rise of the department store and shopping mall; the relationship of race, ethnicity, and gender to the market; globalization; and anticonsumerism.

**HISA 120A. The Supreme Court and the Constitution (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the intellectual and political sources of the Constitution in English, colonial, and revolutionary war history; the Philadelphia convention and the debate over ratification; the formative impact of the Marshall court; and the crisis over slavery and the nature of the Union. Discusses the role of the court in protecting U.S. capitalism and then examines the court's role in legitimizing the New Deal by 1953. The main materials of the course are the actual opinions of the court.

**HISA 120B. The Supreme Court and the Constitution (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines constitutional history after the New Deal settlement of issues concerning the powers of the national government. Explores the court's focus after 1953 on the struggle over racial and gender equality and on the expansion and protection of individual liberties contained in the Bill of Rights. The main materials of the course are the major court opinions from the Warren to the Rehnquist courts, 1953-2001.

**HISA 122A. Religious Cultures in Early America (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 017A is recommended. An introduction to religious beliefs and practices during the seventeenth and eighteenth centuries in the colonies that became the United States. Cross-listed with RLST 137A.

**HISA 122B. Religious Cultures in Modern America (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST

017B is recommended. An introduction to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with RLST 137B.

**HISA 123. American Economic History (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 (or ECON 002H), ECON 003; or ECON 004. Covers the economic history of the United States from colonial times to the present. Cross-listed with ECON 123.

**HISA 124. Labor and Working Class History of the United States (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the history of work, workers and their families, communities, organizations, unions, and workers' organizations in the United States from the mid-nineteenth century to the present. Attention is paid to gender, race, immigration, and diversity of the work force, and role of government, within an economic and international context.

**HISA 125 (E-Z). Topics in American Thought and Culture (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): HIST 017A; HIST 017B; upper-division standing or consent of instructor. Focused studies in cultural and intellectual history. Employs thematic development and an approach from a transnational perspective. E. The United States in the Global 1960s.

**HISA 126. Family Histories and American Culture (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores experiences of family and kinship in the nineteenth-century United States, especially in the context of Indian removal, racial slavery, and settler imperialism. Readings include family history, memoir, and historical monographs. Provides context for recent developments in genealogical research as they relate to American family history.

**HISA 132. U.S. Women, Gender, and Sexuality: 1620-1850 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers topics in early American women's lives—work, politics, and sexuality—while charting the developments of gendered systems in the United States. Topics may include masculinity, the rise of the middle class, and the private-public dichotomy. Cross-listed with WMST 132.

**HISA 133. Women, Gender, and Sexuality in U.S. History: 1850-Present (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces students to major themes in the history of U.S. women and gender issues. Drawing upon recent work in the field, it explores the relationships between gendered meanings of politics and the politics of gender in the late nineteenth and twentieth centuries in the United States. Cross-listed with WMST 133.

**HISA 134. African American Women (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers the writings and collective organizational strategies of African American women intellectuals and activists developed in response to the ways racial, sexual, and economic oppression work interdependently and are institutionalized. Beginning with early women's slave narratives, follows black women's agendas for social change to the present. Cross-listed with ETST 113.

**HISA 135. The Civil Rights Movement, 1950-1970 (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The Civil Rights Movement of the 1950s and 1960s. The main focus will be on the "grass roots." African

American aspects of "The Movement," as it was popularly known, from school desegregation to voting rights and beyond. Cross-listed with ETST 112.

**HISA 137. Frontier History of the United States (4)**

Lecture, 3 hours; journal, 1 hour; term paper, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the frontier in U.S. history, with special attention to the Western frontier and borderlands.

**HISA 138. California (4)** Lecture, 3 hours; journal, 1 hour; term paper, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. HISA 137 is recommended but not required. The history of California from the earliest discoveries to the present.

**HISA 139. American Musical Subcultures: A Genealogy of Rock (4)** Lecture, 3 hours; extra reading, 0-2 hours; listening, 2-3 hours. Prerequisite(s): upper-division standing or consent of instructor. A historical and cultural overview of the genre of American popular music known as "rock." Covers themes ranging from musical form and structure, aesthetics, and audio technology to community and individualism, gender and racial identity, political resistance, and the music industry. Cross-listed with MUS 140.

**HISA 140. California Indian History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides students with a broad understanding of the rich and varied heritage and history of California Indians from the invasion of the Spanish to the twentieth century. Examines geographically and culturally diverse groups as a means of illustrating the various Euro-American Indian policies that affected native Californians. Course is comparative and thematic. Cross-listed with ETST 180.

**HISA 141. Southwestern Indian History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Presents a historical examination of selected Native American groups in the Southwest. Examines the relationship of Southwestern Indians to the Spanish, Mexican, and United States governments. Focuses on Quechans, Tohono O'odam, Yavapai, Chiracahuas, Navajos, Zunis, Hopis, Comanches, and selected Pueblos along the Rio Grande. Cross-listed with ETST 181.

**HISA 142. Northwestern Indian History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected aspects of Northwestern Indian History, from approximately the 1750s to the twentieth century. Deals with several native groups along the Northwest coast from Alaska to Oregon. Compares policies of the Russian, Spanish, English, and United States governments. Particular emphasis on the 1850s when the U.S. negotiated a number of treaties with Native Americans in the Washington and Oregon territories. Cross-listed with ETST 182.

**HISA 143. Native American Oral Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 007; upper-division standing or consent of instructor. Comparative examination of Native American oral literature of tribes in the United States, Canada, and Mexico. Enhances the student's understanding of Native American language, literature, drama, geography, geology, biology, history, and culture. Cross-listed with ETST 183.

**HISA 144 (E-Z). Topics in Native American History (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Selected topics addressing the issues of the Native American. Includes reading, research, and discussion on the Native American experience. F. Early

America: Emerging Interpretations. Cross-listed with ETST 115 (E-Z).

**HISA 146. History of Native American Women (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected important aspects of the lives of Native North American women, including their political, economic, and religious participation in their societies. Further traces historic changes in Native women's lives as a result of the colonization of the New World and examines the complex imagery of Native women that developed from colonial contact. Cross-listed with WMST 146.

**HISA 147. Medicine Ways of Native Americans (4)**

Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the medical history of Native Americans. Focuses on traditional Native American medicine and how Western diseases, medical practices, health care, and policies influenced American Indian health. Topics include medicine people, rituals, ceremonies, smallpox, measles, influenza, anomie, accidents, diabetes, suicides, mental illness, and murders. Cross-listed with ETST 116.

**HISA 160. Colonial Latin America (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour.

Prerequisite(s): upper-division standing or consent of instructor. A history of Latin America from pre-Columbian times to independence with an emphasis upon selected themes concerning the social, economic, and cultural aspects of colonialism. Cross-listed with LNST 170.

**HISA 161. Nineteenth-Century Latin America (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the breakdown of political order and the problem of the nation-state, liberalism and conservatism, slavery and abolition, foreign intervention and capital investment, the reemergence of political order in the Age of Liberalism (1860-1900), and social and cultural change. Cross-listed with LNST 171.

**HISA 162. Twentieth-Century Latin America (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the Mexican Revolution, the Great Depression, populism, industrialization, revolution, and the emergence of conservative regimes in the age of neoliberalism. Cross-listed with LNST 172.

**HISA 163A. Colonial Mexico (4)** Lecture, 3 hours;

extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The history of Mexico to independence.

**HISA 163B. Modern Mexico (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The history of Mexico since independence.

**HISA 164A. The United States and Latin America to 1930 (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of United States-Latin American relations from 1776 to the Good Neighbor Policy. Topics include the Monroe Doctrine; United States expansionism and the Latin American response; the United States-Mexican War; and the age of imperialism, 1895-1928.

**HISA 164B. The United States and Latin America since 1930 (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of United States-Latin American relations from the Good Neighbor Policy to the present. Topics include United States intervention after

1945; the Cold War and counterrevolution; crises in Guatemala, Cuba, Brazil, Chile, Nicaragua, and El Salvador; and defining the new enemy after the Cold War.

**HISA 165. Modern Brazil: State and Society (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes power and resistance in Brazilian history with emphasis on the social and political movements challenging state power. Topics include slave rebellions, banditry, millenarian uprisings, the industrial working class, the urban poor, social Catholicism, feminism, and "Black Power."

**HISA 166. Modern Argentina: Democracy and Dictatorship (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the major issues in modern Argentine history. Topics include industrialization and trade union politics, Peronism, the rise of the revolutionary left, militarism, state terrorism, political culture and the cultural dimensions of violence, and state and society during the democratic transition.

## History of Europe

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### Upper-Division Courses

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**HISE 110. Ancient Historians (4)** Lecture, 3 hours; outside research, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The historical development of historiography as evidenced in ancient historical writings from Near Eastern king lists and biblical histories to the narrative histories of Greece and Rome. Focuses on the ideas of history in the various cultures of the ancient Near East and Mediterranean and their relation to modern historical thought. Cross-listed with CLA 100.

**HISE 111. Ancient Greece from the Bronze Age to the Persian Wars (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the history of Greece from the late Bronze Age to the end of the Persian Wars. Focuses on the Mycenaean civilization; the rise of the *polis* in Athens and Sparta; the Ionian Enlightenment; and the Persian Wars.

**HISE 112. Ancient Greece from Classical Athens to the Death of Alexander (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the history of Greece from the Persian Wars to the death of Alexander the Great. Focuses on Athens, its empire and democracy, and on the Macedonian Empire of Philip and Alexander. Special attention is given to the Greek cultural achievement within the context of changing political and social conditions.

**HISE 113. Comparative Ancient Historical Writing (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the literary aspects of historical writing in ancient cultures, with some comparison of the ancient contribution to later authors of the genre. Cross-listed with CLA 113 and CPAC 112.

**HISE 114. Ancient Writing and Literacy (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Uses cross-cultural comparison to survey writing and literacy in ancient civilizations and how they are related in the origin and development of selected ancient cultures. Cross-listed with CPAC 133.

**HISE 115. The Roman Republic (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the political, economic, institutional, social, and cultural history of Rome from its foundation until the end of the Roman Republic (27 B.C.). Focuses on prominent figures and moments of crisis as it examines the forces that brought Rome to the forefront of the Mediterranean world.

**HISE 116. The Roman Empire (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the political, economic, institutional, social, and cultural history of the Roman Empire from the first Emperor, Augustus, until the first Christian emperor, Constantine. Focuses on notable figures such as the Julio-Claudian emperors, Nero and Claudius, and on significant periods to help students understand the successes and failures of the Roman Empire.

**HISE 117. Decline and Fall of the Roman Empire (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the weaknesses in the Roman Empire that led to its demise, as well as the circumstances in which the new religions and empires came into existence, through a study of the period from the third to the seventh centuries A.D.

**HISE 118. Ancient Greece: The Hellenistic Age from Alexander to Cleopatra, 336-31 B.C. (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the history of Greece and the Eastern Mediterranean from Alexander the Great to the death of Cleopatra (336-31 B.C.). Explores the dramatic political, social, economic, and cultural changes that took place during the Hellenistic Age until the conquest by Rome.

**HISE 120. Early Middle Ages (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics in medieval history, from the end of classical antiquity to the 11th Century, including Christianity, Islam, the Byzantine Empire, and the barbarians.

**HISE 121. The High Middle Ages (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics in medieval history, from the 11th to the 14th century, including the development of medieval institutions, the 12th century Renaissance, and the rise of European universities.

**HISE 122. Lord, Peasant, and the Manor in Medieval Europe (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The course will give undergraduates a basic historiographic introduction to the medieval estate as a unit of land use, settlement, and lordship. It will be based on secondary literature, a selection of classical works on the medieval estate, and recent revisions of the major themes and models raised by the classical works.

**HISE 123. Law and Society in Medieval Europe (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Surveys the legal system of Europe from the late crisis of the Roman Empire to the late fourteenth century. Explores the premedieval legal heritage of Europe (Roman law, early canon law, customary laws of various peoples), transformations of that heritage in the central Middle Ages (revival of Roman and canon law, custom and legislation, use and abandonment of the ordeal), and the relationship between the resulting legal systems and royal authority. Primary sources are the central component of the course materials.

**HISE 131. The Renaissance (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Western Europe from 1400-1527 with special attention to Italy.

**HISE 132. The Reformation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Europe from 1517 to 1618, with special attention to the key events of the continental reformation.

**HISE 133. Women Artists in Renaissance Europe, 1400-1600 (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Surveys the lives and work of women artists in Renaissance Europe from perspectives offered by the latest scholarly literature. Key topics considered are circumstances under which it was possible for women to become artists, how these women evolved from artists practicing in the cloistered convent to artists participating in the competitive public market place, what they painted, and who their patrons were. Cross-listed with AHS 165 and WMST 170.

**HISE 134. Art and Society: Patrons and Museums (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how patrons and museums have influenced the production and reception of art. Topics include patronage, collecting, and audience for art in Renaissance Italy; modern American megapartners, such as the Gettys and Rockefellers; and multimedia museum programs used to educate a wider public in the visual arts. Cross-listed with AHS 134.

**HISE 135. Absolutism and Enlightenment (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The development of monarchic absolutism in the 17th and 18th centuries and the intellectual Enlightenment.

**HISE 136. The Age of Revolution (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The French Revolution and its impact upon Europe from the 1780s through the reign of Napoleon Bonaparte.

**HISE 140. Nineteenth-Century Europe (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Europe from 1815 to 1914. Topics include the Industrial Revolution, the revolutions of 1848, Bismarck and the unification of Germany, the rise of mass politics, imperialism, and the origins of World War I.

**HISE 141. Europe, 1914-1945 (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Europe from 1914 to the end of the Second World War. Topics include World War I, the rise of fascism and communism, the crisis of the Western democracies, the diplomacy of appeasement, World War II, and the Holocaust.

**HISE 142. Europe Since 1945 (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The comparative social and political history of Europe from 1945 to the present. Topics include the cold war; decolonialization; the emergence of the neoliberal welfare state; the Common Market; de Gaulle, Communism and detente; technology and new forms of social protest.

**HISE 145. World War I (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the origins of the conflict and its development into the

world's first war and the first total war. Special attention given to the role of technology in the war and to the social consequences of the war.

**HISE 146. The Second World War (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The diplomatic origins of the war; the fighting in Europe, Asia and Africa; Nazi oppression in conquered Europe and the destruction of the Jews; the social, economic and technological impact of the conflict; and the origins of the Cold War.

**HISE 147. The Holocaust (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the extermination of European Jewry during World War II. Surveys the history of the "Jewish Question"; Jewish-Christian relations; race; the systematic persecution and genocide of the Jews; and world responses to genocide. Addresses religious, philosophical, and political implications of the Holocaust, as well as continuing anti-Semitic trends. Cross-listed with RLST 127.

**HISE 148A. Women and Gender in Early Modern Europe, 1348-1800 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory survey of women and gender relations in early modern Europe. Topics include women in the Italian Renaissance, the Protestant and Catholic reformations, the witchcraft persecutions, the Enlightenment, and the French Revolution.

**HISE 148B. Women and Gender in Europe, 1800-present (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introductory survey of women and gender in Europe. Topics include changes in gender relations and the roles of women in the family, workplace, and politics; sexuality and science; and the debate over the "woman question."

**HISE 150. Ancient and Medieval England (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A broad but occasionally intensive survey of England from its prehistory to the beginning of the Tudor period (c. 1500). Social and legal developments will be stressed.

**HISE 151. England: 1485-1760 (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the development of England from the sixteenth century until her emergence as a major power at the accession of George III. An assessment of social, economic, and legal changes as well as important political events.

**HISE 152. Modern Britain (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the rise of Great Britain to world domination in the late eighteenth and nineteenth centuries and its subsequent fall from grace in the twentieth century. Special emphasis on major changes in the economy.

**HISE 153. History of the Common Law (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the development of the English Common Law beginning with the reign of Henry II and extending into the early eighteenth century. Special attention to the history of the jury.

**HISE 154. The History of London (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper division standing or consent of instructor. Examines the growth of London over the past 2000 years. Concentrates on how London

became a world city, as well as how residents coped (or failed to cope) with the social and environmental problems created by the city's enormous size.

**HISE 155. Tudor England (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines sixteenth-century England with particular attention to the impact of the Reformation, the "price revolution," and the development of the state.

**HISE 157. Eighteenth-Century Britain, 1714-1815 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes Great Britain's emergence as one of the dominant world powers in the eighteenth century. Particular attention is paid to the realm's social and economic transformation and to its often problematic imperial visions.

**HISE 162. Germany from Bismarck to Hitler (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Germany from Bismarck's accession as chancellor in 1862 to Hitler's defeat in 1945, with special attention to the economic underpinnings of the period and the process of social and economic modernization.

**HISE 163. Modern German History through Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores twentieth-century German history through film. Includes World Wars I and II, inflation and polarization of classes, Nazi Germany, representations of the Holocaust, and a divided and reunited Germany. Cross-listed with CPLT 115, GER 163, and MCS 115.

**HISE 165. Modern France (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of major themes in French history since the Revolution. Topics include the revolutionary tradition, social change in the countryside and city, the Dreyfus Affair, the experience and legacy of two world wars, and May 1968.

**HISE 168 (E-Z). Topics in European History (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Selected topics addressing the issues of European history. F. Religious Conflict and Coexistence in Europe; G. Spain as a World Power, 1469-1821.

**HISE 169. History of Democracy to 1800 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative analysis of democratic political systems before 1800. Examines institutional forms, political culture and rituals, and theoretical discussions. Draws cases from classical Greece and Rome and from Renaissance and early modern Europe.

**HISE 171. Early Russia (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Russia from pre-history to the establishment of the Romanov dynasty. Deals with the Slavic, Norse, and Asian origins of the Kievan state, the impact of the Mongol conquest, the rise of Moscow, and the Time of Troubles in the seventeenth century. Special attention to European vs. Asian influences.

**HISE 172. Imperial Russia (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Russia under the Romanov dynasty, 1650-1917. Using the twin themes of absolute monarchy and the rise of revolutionary movements, the course deals with such topics as Peter the Great, autocracy, the nobility, serfdom, the radical intelligentsia, and the origins of the Russian Revolution.

**HISE 173. Religion and Nationality in Imperial Russia (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces students to the great religious, national, and ethnic diversity inside the Russian Empire (1552-1917). Topics include colonial expansion and frontiers; attitudes and policies toward non-Russians; discovery and defense of ethnoreligious identities; nation-building and nationalisms; nationality conflicts, violence, and revolution.

**HISE 174. Russia Since 1917 (4)** Lecture, 3 hours; online discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Russia from 1917 to the present, with emphasis on the Russian Revolution, the Communist Party, Stalinism, the Great Purges, World War II, and the Khrushchev, Brezhnev, and Gorbachev years. Revolutionary change in a traditional society will be a central theme.

**HISE 175 (E-Z). Topics in Russian History (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): HISE 172 or HISE 174 or consent of instructor. Selected topics addressing the issues of Russian history. E. The Stalin Period.

**HISE 176. Serbia, Bosnia, and Kosovo: The Contemporary Crisis and Its Historical Roots (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores historical precedents for the current Yugoslav crisis. Examines the tragic events of the 1990s and South Slavic history from the Ottoman conquest to World War II. Focus is on the national histories and mythologies of Serbs, Bosnians, and Albanians.

## Honors Program

See University Honors Program

## Humanities, Arts, and Social Sciences

Subject abbreviation: HASS  
College of Humanities, Arts, and Social Sciences

Theda Shapiro, Ph.D., Chair  
Committee Office, 2417 Humanities  
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(951) 827-2743; [hass.ucr.edu](mailto:hass.ucr.edu)

### Committee in Charge

John Laursen, Ph.D. (Political Science)  
Erich Reck, Ph.D. (Philosophy)  
Erika Suderburg, Ph.D. (Art)  
Carole-Anne Tyler, Ph.D. (English)  
Stephen E. Cullenberg, Ph.D.,  
*Dean, College of Humanities, Arts and Social  
Sciences, ex officio*

### Major

The Humanities, Arts, and Social Sciences major is an interdisciplinary major designed for students who have specific interests that cannot be accommodated within any one of the departments in the College of Humanities, Arts, and Social Sciences and who wish to construct a coherent program of their own. The Humanities,

Arts, and Social Sciences major is not intended for students whose interests are undecided; students proposing a Humanities, Arts, and Social Sciences major must propose a specifically focused interdisciplinary topic or a two-field area. Such students must have a faculty advisor who is a member of the UCR Academic Senate.

The Humanities, Arts, and Social Sciences major is fulfilled by a course of studies determined in consultation with an advisor and with the full approval of the chair and three members of the committee overseeing the major. The student may construct either an interdisciplinary option or a two-field option for the major as described below.

**Admission** Students who wish to select a Humanities, Arts, and Social Sciences major must fill out a form and submit a carefully worded statement of purpose showing meaningful course interrelations. The Humanities, Arts, and Social Sciences Interdisciplinary Committee considers each proposal in the context of the student's topic and statement of purpose.

Students whose proposals are being approved should petition for a change in major only after they have been informed of the committee's approval of their interdisciplinary program. Every subsequent change in the student's initial program must be approved by the advisor; a record of the program and of program changes is kept in the student's files.

Humanities, Arts, and Social Sciences courses are supervised by the committee and are open to major as well as nonmajor students.

**Interdisciplinary Option** The interdisciplinary option is built around a central concept in humanities and social sciences. The concept might be a specific culture, country or ethnic group such as Italian civilization and culture; an age or period such as the Renaissance or the industrial revolution; a great social issue or human problem such as war, revolution, communication; or any other topic which receives significant attention from several disciplines.

**Two-Field Option** In special circumstances the committee sponsors a two-field option for the major designed to allow students to combine studies in two disciplines. Such majors are approved only if they cannot be accommodated within a dual major or within the Liberal Studies Program.

### University Requirements

See Undergraduate Studies section.

### College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

### Major Requirements

The major requirements for the B.A. degree in Humanities, Arts, and Social Sciences are as follows: Students may choose either an interdisciplinary or a two-field option.

**Interdisciplinary Option**

- Upper-division requirements (38-unit minimum)
  - A minimum of 32 units directly related to the chosen central concept
  - At least 6 units (but not more than 8 units) HASS 195 and/or HASS 196
- The committee may require upper-division courses beyond those indicated above if the topic of study requires specific language, quantitative, or methodological proficiency.

**Note** The senior thesis or research paper is the culmination of the major and represents an interdisciplinary approach to the central concept of the major. HASS 195 (Senior Thesis) and HASS 196 (Senior Research Paper) are supervised by a faculty advisor and designed to bring into focus a substantial portion of the major.

The following are sample interdisciplinary programs:

**Revolution** ANTH 127, ECON 115A or ECON 115B, HIST 104, HISE 174, POSC 112, PHIL 163, PHIL 153, HASS 195 (8 units).

**Renaissance** AHS 161, CPLT 150J, ENGL 153, ENGL 154, HISE 131, MUS 101A, SPN 140 (E-Z), HASS 195 (8 units).

**Two-field Option**

- Upper-division requirements (56 units)
 

Twenty-eight (28) units in each of two fields, supervised by a faculty advisor
- The committee may require upper-division courses beyond those indicated above if the topic of study requires specific language, quantitative, or methodological proficiency.

**Lower-Division Courses****HASS 001. Step-by-Step to College Success for Freshmen (2)**

Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): none. Involves weekly readings, writing assignments, and class discussions dealing with factors relating to academic success. Topics include social and psychological adjustment to college life. Students investigate a wide range of academic disciplines and campus student support services. Graded Satisfactory (S) or No Credit (NC). *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 004. College of Humanities, Arts, and Social Sciences (CHASS) Connect Program Workshop (1)**

Workshop, 1 hour. Prerequisite(s): concurrent enrollment in the corresponding CHASS Connect program course. Introduces academic life by examining methods of successful achievement and exploring campus resources. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 3 units. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 010. Arts and Ideas Experience (2)** Workshop, 2 hours per quarter; individual study, 3 hours; written work, 2.5 hours. Prerequisite(s): none. Explores lectures, performances, and visual arts on the UC Riverside campus. Activities include attending at least one university- or faculty-sponsored performance, lec-

ture, exhibition, or concert each week and writing a one-page review. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 24 units. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 020A. Flashpoint: The Individual in Conflict (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Explores the psychological and visceral experience of conflict in venues of immediate relevance to our individual lives. This course is the first of three in a yearlong, multidisciplinary sequence about the place of conflict in the psychological, political, and aesthetic realms. Students are encouraged, but not required, to take HASS 020B and HASS 020C. *Fulfills the Psychology or Social Science additional requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 020B. Conflict by Design: Scales of Organization, Power, and Authority (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Explores the organizational contexts in which conflict may occur, focusing especially on the group and national levels, and introducing analytical approaches to conflict. This course is the second in a yearlong, multidisciplinary sequence about the place of conflict in the psychological, political, and aesthetic realms. Students are encouraged, but not required, to take HASS 020A and HASS 020C. *Fulfills the Political Science or Social Science additional requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 020C. At Odds with All Things: The Roles of Conflict in Philosophy, Art, and Literature (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Examines how conflict has been epitomized, articulated, and represented in the humanities and the arts and asks whether the humanities are an attempt to resolve conflicts or a kindling of them. This course is the third of three in a yearlong, multidisciplinary sequence about the place of conflict in the psychological, political, and aesthetic realms. Students are encouraged, but not required, to take HASS 020A and HASS 020B. *Fulfills the Literature or the Humanities additional requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 021A. Asian/Americans Making Culture:**

**Religion (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Explores the movement of Asian religions to America and the creation of new modes of religious expression. This course is the first of three in a yearlong, multidisciplinary sequence about the making of culture in Asian/American communities. Students are encouraged, but not required, to take HASS 021B and HASS 021C. *Fulfills the Humanities (Additional) or Social Sciences (Additional) requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 021B. Asian/Americans Making Culture:**

**Music (4)** Lecture, 3 hours; outside research and term paper, 3 hours. Explores Asian/American musics as a window on the cultural politics of Asian America. This course is the second of three in a yearlong, multidisciplinary sequence about the making of culture in Asian/American communities. Students are encouraged, but not required, to take HASS 021A and HASS 021C. *Fulfills the Humanities (Additional) requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 021C. Asian/Americans Making Culture:**

**Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Explores how Asian/Americans create a distinctive print culture through poetry, short stories, novels, and magazines. This course is the third of three in a year-

long, multidisciplinary sequence about the making of culture in Asian/American communities. Students are encouraged, but not required, to take HASS 021A and HASS 021B. *Fulfills the Humanities (Additional) requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 022A. U.S.-Mexican Borderlands (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Presents an anthropological overview of the formation of the borders between Mexico and the United States, and the border regions and communities associated with them. This course is the first of three in a yearlong multidisciplinary sequence about society and culture in the U.S.-Mexican borderlands. Students are encouraged, but not required, to take HASS 022B and HASS 022C. *Fulfills the Humanities (Additional) or Social Sciences (Additional) requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 022B. U.S.-Mexican Borderlands: Theatre and Performance (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Explores the idea of the border and the making of U.S.-Mexican border culture through theatre, comedy, performance art, and film. This course is the second of three in a yearlong, multidisciplinary sequence about society and culture in the U.S.-Mexican borderlands. Students are encouraged, but not required, to take HASS 022A and HASS 022C. *Fulfills the Humanities (Additional) or Fine Arts requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 022C. U.S.-Mexican Borderlands: Word, Sound, and Image (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Explores the idea of the border and the making of U.S.-Mexican border culture through literature, popular music, and visual culture, with a close study of three border cities: Juarez, Tijuana, and Riverside. This course is the third of three in a yearlong, multidisciplinary sequence about society and culture in the U.S.-Mexican borderlands. Students are encouraged, but not required, to take HASS 022A and HASS 022B. *Fulfills the Humanities (Additional) or Literature/Philosophy/Religious requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 023A. Concepts of the Physical Sciences through**

**Science Fiction (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An exploration of the concepts and development of the physical sciences through the medium of science fiction. This course is the first of three in a yearlong, multidisciplinary sequence that bridges the “two cultures” of science and the humanities. Students are encouraged, but not required, to take HASS 023B and HASS 023C. Credit is awarded for only one of HASS 023A or HNPQ 037F. *Fulfills the Humanities (Additional) or Literature requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 023B. The Ancient Sciences through Science**

**Fiction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A comparative exploration of the ancient sciences through the medium of science fiction. This course is the second of three in a yearlong, multidisciplinary sequence that bridges the “two cultures” of sciences and the humanities. Students are encouraged, but not required, to take HASS 023A and HASS 023C. *Fulfills the Humanities (Additional) or Literature requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 023C. Concepts of the Biological Sciences**

**through Science Fiction (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An exploration of the concepts and development of the biological and ecological sciences through the medium of science

fiction. This course is the third of three in a yearlong, multidisciplinary sequence that bridges the “two cultures” of science and the humanities. Students are encouraged, but not required, to take HASS 023A and HASS 023B. Credit is awarded for only one of HASS 023C or HNPG 037F. *Fulfills the Humanities (Additional) or Literature requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 024A. A Course about Me: Autobiography in Literature and Performance (4)** Lecture, 3 hours; workshop, 1 hour. Prerequisite(s): none. A hands-on, intensive combination of discussion and workshop whereby students develop autobiographical projects while studying seminal literary, performance, and theoretical texts. This is the first segment of a two-quarter, multidisciplinary sequence. Students are encouraged, but not required, to take HASS 024B. *Fulfills the Fine Arts or the Humanities additional requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 024B. A Course about Me: Autobiography in Literature and Performance (4)** Lecture, 3 hours; workshop, 1 hour. Prerequisite(s): HASS 024A. A hands-on, intensive combination of discussion and workshop whereby students develop autobiographical projects while studying seminal literary, performance, and theoretical texts. This is the second segment of a two-quarter, multidisciplinary sequence. *Fulfills the Literature or the Humanities additional requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 068A. The 1960s and the Vietnam Era (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): Sophomore standing or consent of instructor. Examines the political, social, economic, and cultural impact of the Vietnam War, with an introduction to economic, historical, and cultural methods of analysis. This course is the first of three in a yearlong, team-taught, interdisciplinary sequence. *Fulfills the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 068B. The 1960s and the Vietnam Era (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): HASS 068A or consent of instructor. Examines the political, social, economic, and cultural impact of the Vietnam War, with an introduction to economic, historical, and cultural methods of analysis. This course is the second of three in a yearlong, team-taught, interdisciplinary sequence. *Fulfills the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 068C. The 1960s and the Vietnam Era (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): HASS 068B or consent of instructor. Examines the political, social, economic, and cultural impact of the Vietnam War, with an introduction to economic, historical, and cultural methods of analysis. This course is the third of three in a yearlong, team-taught, interdisciplinary sequence. *Fulfills the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 082. Major Themes in Contemporary Research and Thinking (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Presents major themes in contemporary thinking and research in an area of the humanities, arts, or social sciences. Discussion sections focus on study of smaller topics and utilize source materials, selected intensive readings, etc. Emphasizes research and writing skills. Rotates among College of Humanities, Arts, and Social Sciences faculty and departments every year. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable as topics change to a maximum

of 10 units. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 090. Special Studies (1-3)** Individual study, 3-9 hours. Prerequisite(s): consent of the chair of the Humanities, Arts, and Social Sciences Interdisciplinary Program. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 8 units.

**HASS 092. First-Year Seminar in the Humanities, Arts, and Social Sciences (1)** Seminar, 10-15 hours per quarter. Prerequisite(s): freshman standing. Enrollment priority is given to freshmen, but sophomores may enroll on a space-available basis with consent of instructor. Introduction to one of the many areas of study explored by the faculty of the College of Humanities, Arts, and Social Sciences in a small-group, highly interactive format. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 3 units of any combination of ENGR 092, HASS 092, and NASC 092; students may enroll in only 1 unit of ENGR 092, HASS 092, or NASC 092 per quarter. *See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.*

## Upper-Division Courses

**HASS 100. Studies in Leadership and Organizational Effectiveness (5)** Discussion, 3 hours; consultation, 3 hours per quarter; practicum, 3 hours; written work, 21 hours per quarter. Prerequisite(s): consent of the instructor. Introduces the social science literature on leadership studies. Students plan and produce a campus event or research project and interact with several California leaders. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**HASS 102. The McSweeney-McCauley Seminar (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): consent of instructor. Presents a topic selected by the current McSweeney-McCauley Chair in Teaching Excellence. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable as topics change to a maximum of 16 units. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**HASS 190. Special Studies (1-5)** conference. Prerequisite(s): consent of the Humanities, Arts, and Social Sciences Interdisciplinary Committee. Directed interdisciplinary study.

**HASS 191S. Seminar in Sacramento (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Center at Sacramento Program. Examines aspects of the Sacramento area, including cultural, political, and governmental institutions and the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Sacramento. Required of participants in the UCR Center at Sacramento Program. Cross-listed with ENGR 191S and NASC 191S. *See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.*

**HASS 191W. Seminar in Washington, D.C. (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Washington Center Program. Examines aspects of the Washington, D.C., area, including cultural, political, and governmental institu-

tions as well as the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Washington, D.C. Required of participants in the UCR Washington, D.C., Center Program. Cross-listed with ENGR 191W and NASC 191W. *See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.*

**HASS 195. Senior Thesis (1-8)** Prerequisite(s): enrollment by request of student with approval of the advisor and the Humanities, Arts, and Social Sciences Interdisciplinary Committee. For honors students who may need one or more quarters to complete the research and writing of a senior thesis. Course is repeatable to a maximum of 12 units.

**HASS 196. Senior Research Paper (1-4)** Prerequisite(s): consent of advisor.

**HASS 198-I. Internship (1-12)** internship, 10 hours per week for each 4 units. Prerequisite(s): upper-division standing and approval of Committee on Independent Student Projects. A student-defined project, the major portion of which is taken off campus. May be supervised by an off-campus instructor and/or UCR advisor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

## Interdisciplinary Studies

### College of Humanities, Arts, and Social Sciences

Susan Ossman, Chair  
Office of Interdisciplinary Programs  
3116 CHASS Interdisciplinary Building  
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#### Committee in Charge

Lynda Bell, Ph.D. (History)  
Chris Chase-Dunn, Ph.D. (Sociology)  
B. Toby Miller, Ph.D. (Media and Cultural Studies)  
Stephen E. Cullenberg, Ph.D.,  
*Dean, College of Humanities, Arts and Social Sciences, ex officio*

The Interdisciplinary Studies major is not currently accepting new students. For more information, contact CHASS Student Academic Affairs, 3400 Humanities and Social Sciences Building, (951) 827-3683.

## International Relations Minor

### College of Humanities, Arts, and Social Sciences

Bronwyn A. Leebaw, Ph.D., Chair  
Office, 2230 Watkins Hall  
(951) 827-5509 or 5312  
[internationalrelations.ucr.edu](http://internationalrelations.ucr.edu)

#### Committee in Charge

Steven Helfand (Economics)  
Irwin Wall (History/Religious Studies)

Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

Offered by the department of Political Science, the International Relations minor offers a basic examination of the major approaches, disciplines, and perspectives of international relations. The study of international relations is necessarily interdisciplinary, focusing on economic, geographic, historical, and political issues and questions.

The International Relations minor is helpful in preparing students for the many careers in the international arena.

Requirements for the minor (28 units)

1. Eight (8) units from HISA 117B, HISE 142, HISE 146, HISA 164B, HISE 174, HIST 182
2. Eight (8) units from ECON 171, ECON 175, ECON 178/BUS 178, ECON 181, ECON 182, ECON 185/LNST 185
3. POSC 124 or POSC 124S
4. Eight (8) units from POSC 123, POSC 125, POSC 126, POSC 127, POSC 128, POSC 129, POSC 130, POSC 155 or POSC 155S, POSC 160 or POSC 160S

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Journalism Minor

### College of Humanities, Arts, and Social Sciences

Andrew Winer, M.F.A., Chair  
 Department Office, ARTS 5424  
 (951) 827-7059; [creativewriting.ucr.edu](mailto:creativewriting.ucr.edu)

#### Committee in Charge

Mike Davis, M.A. (Creative Writing)  
 Claire Hoffman, M.S.J. (Creative Writing)  
 Martin Johnson, Ph.D. (Political Science)  
 Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

Offered by the Department of Creative Writing, the minor offers basic examination of the theory, practice and ethics of contemporary journalism, with an emphasis on reporting and editing. Coupled with work on student publications and internships, the minor serves as an entryway to professional writing in news media or to graduate study in journalism.

Lower-division requirements (9 Units)

1. ART 003
2. CRWT 057C

Upper-division requirements (20 units)

1. Eight (8) units from:
  - a) CRWT 165
  - b) CRWT 175
2. Eight (8) units from:

a) CRWT 174

b) One (1) course either from an approved list of media-related upper-division courses, or, with the approval of the academic advisor for journalism minors, an upper-division course relevant to an area of journalism specialization.

3. Either CRWT 195: Senior Thesis [4], or CRWT 198I: Internship [4]. Students electing a thesis will complete a series of news features or an investigative article or series requiring significant endeavor in reporting and writing and demonstrating an understanding of sound journalistic principles. CRWT 195 is open to seniors only. Students completing CRWT 198I must complete 4 units of internship with a journalism organization.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Labor Studies Minor

**Subject abbreviation: LABR**  
**College of Humanities, Arts, and Social Sciences**

Ellen Reese, Ph.D., Chair  
 Office, 1217 Watkins Hall  
 (951) 827-2930; [ellen.reese@ucr.edu](mailto:ellen.reese@ucr.edu)

#### Committee in Charge

Jorge Aguero, Ph.D. (Economics)  
 Edna M. Bonacich, Ph.D. (Sociology/Ethnic Studies)  
 James Brennan, Ph.D. (History)  
 Amalia Cabezas, Ph.D. (Women's Studies)  
 Susan Carter, Ph.D. (Economics)  
 Christopher Chase-Dunn, Ph.D. (Sociology)  
 Mike Davis, Ph.D. (Creative Writing)  
 David H. Fairris, Ph.D. (Economics)  
 Alessandro Fornazzari, Ph.D. (Hispanic Studies)  
 John N. Medearis, Ph.D. (Political Science)  
 Dylan Rodriguez, Ph.D. (Ethnic Studies)  
 Todd Sorensen, Ph.D. (Economics)  
 Devra A. Weber, Ph.D. (History)

Labor studies is an interdisciplinary minor that focuses on the conditions, activities, and struggles of workers and other members of the working class from an international, contemporary, comparative and historical perspective. Although trade unions are the primary focus, students will also examine other forms of working class organizing, including community organizing, and organizing by women and people of color. Courses focus on work in formal workplaces, including service, industrial, clerical, professional, and managerial work, and may also address other forms of work, such as unpaid housework, prison labor, or work in the informal economy. The minor addresses issues affecting workers, including governmental policies, technological change, globalization, neoliberalism, and alternative models for organizing for social justice. In addition to taking academic courses, students gain hands-on

experience through a one-quarter internship with a union or related organization. This minor helps to prepare students for careers in labor and community organizing, labor law, or labor regulatory agencies.

1. Five courses (at least 20 units) from the approved list of courses
2. An introductory labor studies course: LABR 001
3. A labor internship (one course [at least 4 units] or the equivalent) approved by the Labor Studies chair and completed through one of the following courses: ANTH 198I, BUS 198-I, ECON 198-I, ETST 198-I, ETST 198G, HISA 198-I, POSC 198G, POSC 198-I, SOC 198-I.
4. One course (at least 4 units) that deals with race or gender inequality: ECON 155/WMST 155, ETST 102, ETST 131, ETST 177, SOC 140, WMST 101, WMST 109/ANTH 109, WMST 140/ANTH 147, WMST 149/ANTH 149
5. Two courses from the following: ANTH 122, ANTH 138, ANTH 139, BUS 144, BUS 155, BUS 157, BUS 160/ECON 160, ECON 146/URST 146, ECON 152/BUS 152, ECON 153/BUS 153, ECON 155/WMST 155, ETST 102, ETST 131, ETST 177, HISA 113, HISA 123/ECON 123, PHIL 116, PHIL 153, POSC 116, POSC 160A, POSC 182, POSC 186, SOC 125, SOC 133, SOC 134, SOC 135, SOC 140, SOC 150, SOC 161, SOC 171, SOC 176/BUS 176, SOC 181, SOC 182/URST 182, WMST 101
6. Students can also petition to the chair of the program to count towards the minor an independent study or regular course not listed above that is relevant to labor studies.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Lower-Division Course

**LABR 001. Introduction to Labor Studies (4)** Lecture, 3 hours; extra reading, 3 hours. Through comparative and historical perspective, examines the social forces shaping labor conditions and workers' struggles for justice. Covers the changing nature of work under capitalism, race and gender discrimination in the labor market, the impact of economic globalization, and unions' successes and limitations.

## Upper-Division Course

**LABR 198-I. Individual Internship in Labor Studies (1-12)** Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): upper-division standing; consent of instructor. Supervised experience in a labor union or related community organization. Focuses on the issues affecting workers and/or low-income people, as well as the prospects and challenges for achieving social justice for working-class people in the contemporary United States. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

# Latin American Studies

**Subject abbreviation: LNST**

**College of Humanities, Arts, and Social Sciences**

Marcelle Chauvet, Ph.D., Chair  
Marta Hernandez-Salvan, Ph.D., Vice-Chair, Office, 3111 INTS,  
(951) 827-2743;  
latinamericanstudies.ucr.edu

## Committee in Charge

Jorge Aguero (Economics)  
Eugene Anderson (Anthropology)  
Alicia Arrizón (Ethnic Studies)  
Wendy Ashmore (Anthropology)  
Will Barndt (Political Studies)  
Victoria Bomberry (Ethnic Studies)  
James Brennan (History)  
Rogerio Budasz (Music)  
Edgar Butler (Sociology, Emeritus)  
Amelia Cabezas (Women's Studies)  
Paulo Chagas (Music)  
Christopher Chase-Dunn (Sociology)  
Ronald Chilcote (Economics, Emeritus)  
Walter Clark (Music)  
Ralph Crowder (Ethnic Studies)  
Luciana Dar (School of Education)  
Gary Dymski (Economics)  
David Fairris (Economics)  
Scott Fedick (Anthropology)  
Linda Fernandez (Environmental Sciences)  
Alfredo Figueroa, Asst. Dean of Students  
Alessandro Fornazzari (Hispanic Studies)  
Paul Green (Ethnic Studies)  
Mark Hanson (School of Education)  
Tenibac (T.S.) Harvey (Anthropology)  
Steven Helfand (Economics)  
David Herzberger (Hispanic Studies)  
Jennifer Hughes (Religious Studies)  
Juliette Levy (History)  
Tiffany Lopez (English)  
Toby Miller (Media & Cultural Studies)  
Stella Nair (Art History)  
Armando Navarro (Ethnic Studies)  
Rhonda Neugebauer, Library  
Michael Orosco (School of Education)  
Robert Patch (History)  
Thomas Patterson (Anthropology)  
Silvana de Paula, Center for Ideas and Society  
Marina Pianca (Hispanic Studies)  
David Pion-Berlin (Political Science)  
Paul Ryer (Anthropology)  
Jonathan Ritter (Music)  
Sergio Rivera-Ayala (Hispanic Studies)  
Leonora Saavedra (Music)  
Roberto Sanchez-Rodriguez, UC Mexus  
Marta Savigliano (Dance)  
Freya Shivy (Media & Cultural Studies)  
Francisco Solá (C&C)  
Todd Sorensen (Economics)  
Karl Taube (Anthropology)  
Devra Weber (History)  
Stephen Cullenberg, *Dean, College of Humanities, Arts, and Social Sciences, ex officio*

## Major

Latin American Studies is an interdisciplinary, area studies major that allows students to com-

bine insights from many related disciplines.

The interdisciplinary focus permits students to study the anthropology, economics, geography, history, sociology, languages and cultures of the region to gain a broad understanding of a complex world area.

The Latin American Studies major provides great flexibility to explore a wide range of subjects of particular interest—from religious cults in the Caribbean to indigenous video in the Andes or the dynamics of agrarian reform in rural Mexico.

The flexibility of the major allows the possibility of completing a double major with other departments such as History, Anthropology, or Political Science.

UCR has a strong faculty in Latin American Studies, with more than 35 members drawn from departments across the campus. More than 125 courses taught at UCR have a significant focus on the region. The strength and breadth of the offerings at UCR permit each student to specialize in the particular country or discipline of greatest interest. Students have many opportunities to get involved in research projects with Latin American Studies professors. Students are encouraged to spend time living and studying in Latin America through, for example, the University of California Education Abroad Program (EAP).

## Career Opportunities

The Latin American Studies major presents numerous opportunities after graduation. The interdisciplinary nature of the program prepares the student for further study in any number of academic fields at the graduate level, including anthropology, geography, history, sociology, Spanish and Portuguese, law, and journalism.

The B.A. degree itself is valuable preparation for many careers, including the U.S. foreign service, nongovernmental development and aid organizations, international organizations, large overseas corporations, banking, foreign missions, journalism and the media, and teaching.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Latin American Studies fall into three major groups. First, students must take Introduction to Latin American Studies (LNST 001) and satisfy a language requirement in either Spanish or Portuguese. Second, students choose three disciplinary areas in which to focus their upper-division work. They must take a total of 24 required units in these three areas. Finally, students take an additional 12 units of elective courses in Latin American Studies. Latin Amer-

ican Studies students are encouraged to take additional coursework at the lower and upper division levels.

The specific requirements for the major are as follows:

1. Lower-division requirements (5 units)
  - a) Introduction to Latin American Studies (LNST 001) or an equivalent course from the following list of lower-division courses:
 

LNST 015/ MUS 015, LNST 016/ MUS 016, LNST 017/ MUS 017, LNST 073A/ DNCE 073A, LNST 073B/ DNCE 073B, ANTH 010, ANTH 027/AHS 027, AHS 028, ETST 002, ETST 004/ HIST 004, ETST 008, MCS 025/ENGL 021/THEA 021, MCS 046/ SPN 046, HASS 022A, GBST 001, GBST 002, HIST 075, POSC 020, RLST 009, RLST 011, SPN 012, WMST 031H, WMST 020
  - b) Proficiency in Spanish to the SPN 005 level or in Portuguese to a comparable level
- Note** Additional course work in Spanish and/or Portuguese recommended for students interested in careers in Latin American fields
2. Upper-division requirements (at least 36 units)
  - a) At least two courses in three of the following groups (at least 24 units total):
    - (1) Anthropology: ANTH 109/ WMST 109, ANTH 111, ANTH 115R, ANTH 115S, ANTH 115U, ANTH 115X, ANTH 117B, ANTH 140J, ANTH 1400, ANTH 161/LNST 161, ANTH 163, ANTH 164/LNST 164/WMST 164, ANTH 168/ETST 148/LNST 168, ANTH 186/LNST 166, ANTH 171
    - (2) Economics and Business: BUS 114, BUS 138, BUS 185, ECON 122E, ECON 178, ECON 181, ECON 182, ECON 185/LNST 185, ECON 187/LNST 187
    - (3) Education/Language: EDUC 114, ETST 146, ETST 165/SOC 165, ETST 166, PORT 101A, PORT 101B, PORT 101C, SPN 101A, SPN 101B, SPN 105, SPN 106A, SPN 106B, SPN 109A, SPN 109B
    - (4) History: ETST 125, HISA 160/LNST 170, HISA 161/LNST 171, HISA 162/LNST 172, HISA 163A, HISA 163B, HISA 164A, HISA 164B, HISA 165, HISA 166, HIST 191V, SPN 172
    - (5) Literature and Cultural Studies: ENGL 121E, ENGL 136, ENGL 136T, ENGL 137T, ETST 114, ETST 170/ WRLT 170, LNST 120/SPN 120C, LNST 153/ETST 153, SPN 102B, SPN 111F, SPN 111W, SPN 121E, SPN 122A, SPN 145, SPN 165, SPN 170(E-Z), SPN 172, SPN 188(E-Z), PORT 162(E-Z), RLST 138

- (6) Arts, Media, and Performance Studies: AHS 112, AHS 113, AHS 115/LNST 115, DNCE 130, DNCE 132, DNCE 135, ETST 154, MCS 125(E-Z)/SPN 125(E-Z)/LNST 125(E-Z), MCS 171/SPN 171, LNST 105/MCS 185/SPN 185, LNST 109/MCS 179/SPN 179/WMST 179, MUS 113, MUS 115, MUS 122, MUS 174, MUS 175
- (7) Politics: ETST 111, ETST 123, ETST 156, POSC 157, POSC 159, POSC 160, LNST 142/POSC 162, LNST 148/POSC 158, SOC 181
- (8) Ethnic Studies and Sociology: ETST 108(E-Z), ETST 109G, ETST 124, ETST 127, ETST 128/SOC 128, ETST 129, ETST 132, ETST 142, ETST 155, ETST 161, ETST 163/SOC 163, ETST 165/SOC 165, SOC 181
- b) At least twelve (12) units selected from other Latin American Studies courses from the disciplinary areas above or from a list of upper-division courses with significant Latin American content available in the program office.

## Minor

Latin American Studies offers a minor consisting of at least 20 upper-division units.

To complete the requirements for the minor, students must select five courses from two of the following groups:

1. Anthropology: ANTH 109/ WMST 109, ANTH 111, ANTH 115R, ANTH 115S, ANTH 115U, ANTH 115X, ANTH 117B, ANTH 140J, ANTH 1400, ANTH 161/LNST 161, ANTH 163, ANTH 164/LNST 164/WMST 164, ANTH 168/ETST 148/LNST 168, ANTH 186/LNST 166, ANTH 171
2. Economics and Business: Economics and Business BUS 114, BUS 138, BUS 185, ECON 122E, ECON 178, ECON 181, ECON 182, ECON 185/LNST 185, ECON 187/LNST 187
3. Education/Language: EDUC 109, EDUC 114, ETST 146/EDUC 146, ETST 165/SOC 165, ETST 166, PORT 101A, PORT 101B, PORT 101C, SPN 101A, SPN 101B, SPN 105, SPN 106A, SPN 106B, SPN 109A, SPN 109B
4. History: ETST 125, HISA 160/LNST 170, HISA 161/LNST 171, HISA 162/LNST 172, HISA 163A, HISA 163B, HISA 164A, HISA 164B, HISA 165, HISA 166, HIST 191V, SPN 172
5. Literature and Cultural Studies: ENGL 121E, ENGL 136, ENGL 136T, ENGL 137T, ETST 114, ETST 170/ WRLT 170, LNST 120/SPN 120C, LNST 153/ETST 153, SPN 102B, SPN 111F, SPN 111W, SPN 121E, SPN 122A, SPN 145, SPN 165, SPN 170(E-Z), SPN 172, SPN 188(E-Z), PORT 162(E-Z), RLST 138

6. Arts, Media, and Performance Studies: AHS 112, AHS 113, AHS 115/LNST 115, DNCE 130, DNCE 132, DNCE 135, ETST 154, FVC 125(E-Z)/SPN 125(E-Z)/LNST 125(E-Z), FVC 171/SPN 171, LNST 105/FVC 185/SPN 185, LNST 109/FVC 179/SPN 179/WMST 179, MUS 113, MUS 115, MUS 122, MUS 174, MUS 175
7. Politics: ETST 111, ETST 123, ETST 156, POSC 124 or POSC 124S, POSC 126, POSC 157, POSC 159, POSC 160, LNST 142/POSC 162, LNST 148/POSC 158, SOC 181
8. Ethnic Studies and Sociology: ETST 108(E-Z), ETST 109G, ETST 124, ETST 127, ETST 128/SOC 128, ETST 129, ETST 132, ETST 142, ETST 155, ETST 161, ETST 163/SOC 163, ETST 165/SOC 165, SOC 181

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Lower-Division Courses

### LNST 001. Introduction to Latin American Studies (5)

Lecture, 3 hours; screening, 1.5 hours; individual study, 3 hours; term paper, 1.5 hours. Introduces key issues in Latin American Studies and how scholars from diverse fields address them. Topics include indigenous cultures; colonial history; poverty; race, gender, and class inequalities; democracy and dictatorship; revolution; and civil war. Integrates film, literature, and music into the course.

### LNST 015. Latin American Folk and Popular Styles (4)

Lecture, 2 hours; discussion, 1 hour; assigned listening, 3 hours. Prerequisite(s): none. Introduction to the vast array of folk and popular styles of music in Latin America, with an emphasis on cultural and ethnic interaction and exchange in the context of Latin American history, politics, and society. Cross-listed with MUS 015.

### LNST 016. Latin American Classical Heritage (4)

Lecture, 2 hours; discussion, 1 hour; assigned listening, 3 hours. Prerequisite(s): none. Survey of the rich heritage of Latin American classical music from Renaissance sacred polyphony to contemporary styles. Emphasis on the gradual emergence of Latin American music from European domination and the establishment of distinctive national traditions in the post-colonial era. Cross-listed with MUS 016.

### LNST 017. Music of Mexico (4)

Lecture, 1 hour; assigned listening, 1 hour. Prerequisite(s): musical training and knowledge of Spanish is useful, but not required. Covers music from 1521 to the present day. Explores the rich musical tradition of Mexico, as well as the relationship between its art and popular music. Cross-listed with MUS 017.

**LNST 073A. Dance of Mexico (2)** Studio, 3 hours; extra reading, 1 hour; screening, 1 hour; individual studio, 1 hour. Prerequisite(s): none. Covers the traditional dances of Mexico at the beginning level. Includes attendance at dance concerts outside of class. Recommended for both nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examina-

tion. Course is repeatable. Cross-listed with MUS 073A.

**LNST 073B. Dance of Mexico (2)** Studio, 3 hours; extra reading, 1 hour; screening, 1 hour; individual studio, 1 hour. Prerequisite(s): LNST 073A/MUS 073A is recommended. Covers the traditional dances of Mexico at the beginning level. Includes attendance at dance concerts outside of class. Recommended for both nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with MUS 073B.

## Upper-Division Courses

### LNST 105. Imagining the Nation: Film and Media in Latin America (4)

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Study of the role of media and film in creating a national imaginary in Latin America. Focus is on one region or nation—such as the Andes, the Caribbean, Mexico, Argentina, or Chile—relating local history to the global context. Course is repeatable as topics change to a maximum of 8 units. Cross-listed with MCS 185 and SPN 185.

### LNST 109. Gender, Media, and Latin America (5)

Lecture, 3 hours; screening, 3 hours; outside research, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores the way Latin Americans have thought of and represented gender across a variety of media, including essays, film, novel or short story, and performance. Compares the possibilities and limitations of these media for representing gender in the Latin American context. Cross-listed with MCS 179, SPN 179, and WMST 179.

### LNST 115. Modern and Contemporary Art of Latin America (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 028 or upper-division standing or consent of instructor. A study of Latin American art from circa 1900 to the present. Considers national and regional histories and artistic trajectories, beginning with the advent of an artistic avant-garde, and investigates the relationships between European and Latin American developments. Cross-listed with AHS 115.

### LNST 120. Major Topics in Hispanic Literature: Latin America (4)

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Reading and analysis of major texts of authors from Latin America. Cross-listed with SPN 120C.

### LNST 125 (E-Z). Topics in Latin American Film and Media (5)

Lecture, 3 hours; screening, 3 hours; extra reading, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of a theme or issue in Latin American film and media. E. Indigenous Video and Latin America. Cross-listed with MCS 125 (E-Z) and SPN 125 (E-Z).

### LNST 138. Colonialism and Religions in Mexico (4)

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers the survival, revival, and invention of religious traditions in ancient and contemporary Mesoamerica. Examines indigenous and immigrant religions through themes such as myths and rituals of pre-Columbian peoples; sexuality and eroticism in religion; Indian theology and theogony; Counter Reformation Catholicism; and growing religious syncretisms. Cross-listed with RLST 138.

**LNST 142. Latin America: The Quest for Development and Democracy (4)** Lecture, 3 hours; extra reading, 2

hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A comparative examination of central issues in and components of Latin American political life. Covers economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Includes Argentina, Chile, Venezuela, and Peru. Cross-listed with POSC 162. Credit is awarded for only one of LNST 142/POSC 162 or LNST 142S/POSC 162S.

**LNST 142S. Latin America: The Quest for Development and Democracy (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A comparative examination of central issues in and components of Latin American political life. Covers economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Includes Argentina, Chile, Venezuela, and Peru. Cross-listed with POSC 162S. Credit is awarded for only one of LNST 142/POSC 162 or LNST 142S/POSC 162S.

**LNST 148. Politics of Mexico (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A survey of contemporary Mexican politics. Emphasis is on recent economic and social changes and their impact on Mexico's political system. Topics include relations with the United States, the rise of drug trafficking in Mexico, and the recent emergence of opposition politics. Cross-listed with POSC 158.

**LNST 153. Contemporary Latin American and Chicano Novels (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Reading, in-depth analysis, and discussion of contemporary Latin American novels in translation and Chicano novels, based on a consideration of their salient, formal, and thematic concerns. Cross-listed with ETST 153.

**LNST 161. Indigenous People and the State in Latin America (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. Reviews the historical processes and regional circumstances that have governed relations between indigenous peoples and Latin American states. Studies concepts of nationalism, ethnicity, and the state in the context of indigenous efforts to resist assimilation and to gain limited autonomy. Compares with the problems and prospects of multiethnic societies worldwide. Cross-listed with ANTH 161.

**LNST 164. Gender and Development in Latin America (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Discusses the role and contribution of Latin American and Caribbean women within their societies. The effects of national economic development policies upon their status and their participation in and integration into the policy-making process are emphasized. Cross-listed with ANTH 164 and WMST 164.

**LNST 166. People and the Environment in Latin America (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An interdisciplinary course focusing on the study of the relation between human communities and the environment in Latin America. Examines environmental problems and policies. Cross-listed with ANTH 186.

**LNST 168. Caribbean Culture and Society (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of the Caribbean region from a historical,

cultural, and political perspective. Emphasis on contemporary issues affecting the Caribbean, and the struggle of its people to maintain their identities. Cross-listed with ANTH 168 and ETST 148.

**LNST 170. Colonial Latin America (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A history of Latin America from pre-Columbian times to independence with an emphasis upon selected themes concerning the social, economic, and cultural aspects of colonialism. Cross-listed with HISA 160.

**LNST 171. Nineteenth-Century Latin America (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the breakdown of political order and the problem of the nation-state, liberalism and conservatism, slavery and abolition, foreign intervention and capital investment, the reemergence of political order in the Age of Liberalism (1860-1900), and social and cultural change. Cross-listed with HISA 161.

**LNST 172. Twentieth-Century Latin America (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the Mexican Revolution, the Great Depression, populism, industrialization, revolution, and the emergence of conservative regimes in the age of neoliberalism. Cross-listed with HISA 162.

**LNST 185. Economic Development in Latin America (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 103 or ECON 104A or ECON 105A. A comparative analysis of the major trends in Latin American economies in the twentieth century. Includes historical legacies, primary export economies, the theory and practice of import substitution industrialization, and the debt crisis. Also covers stabilization and structural adjustment, poverty and income distribution, the informal and agricultural sectors, and the environment. Cross-listed with ECON 185.

**LNST 187. Contemporary Public Policy Challenges in Latin America (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 004 or consent of instructor. A survey of the wide-sweeping policy reforms since the 1980s and of contemporary public policy challenges in Latin America. Challenges discussed include extremely high levels of poverty and inequality, inadequate educational and healthcare systems, pressures for land reform, problems of trade competitiveness, and recurring currency crises. Cross-listed with ECON 187.

**LNST 188. U.S.-Latin American Relations (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores international relations between the United States and the nations of Latin America. Examines different theories for explaining changes in the conduct of U.S.-Latin American relations over time. Topics include democracy and empire, revolution and counter-insurgency, economic integration and trade, petroleum politics, drug trafficking, and migration flows. Cross-listed with POSC 161.

**LNST 190. Special Studies (1-5)** Consent of the instructor and the Latin American Studies Committee required.

## Law and Society

**Subject abbreviation: LWSO**  
**College of Humanities, Arts, and Social Sciences**

Piotr Gorecki, Ph.D., Chair  
Committee Office, 1604 Humanities  
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### Committee in Charge

John Cioffi (Political Science)  
Carl Cranor (Philosophy)  
David Eastmond (Neuroscience)  
Paul Green (Ethnic Studies)  
Robert Parker (Sociology)  
Georgia Warnke (Political Science)  
Fariba Zarinebaf (History)  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

## Major

The Law and Society major offers undergraduates an interdisciplinary liberal arts approach to the study of legal and law-like relationships and institutions. The program combines the perspectives of various disciplines in the Humanities and Social Sciences. The multidisciplinary approach introduces students to a wider range of views about law than is generally possible within a single department, provides a coherent and rigorous program of courses organized around the theme of law and law-like relationships, and allows students to develop critical thinking about law and social institutions.

For students not planning to pursue graduate studies, this program offers a means of understanding some complex relationships between social institutions. For those who plan to pursue graduate studies, the breadth of course work should provide a sound basis for graduate studies in areas related to law: history, philosophy, political science, and sociology, among others. And for students who choose to pursue the study of law in a professional school of law, the curriculum can offer a sound background.

Students may select Law and Society as a major with the departments of Anthropology, Economics, History, Philosophy, Political Science, Psychology, and Sociology.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Law and Society are as follows:

1. Specified requirements of the cooperating department (See the departments of Anthropology, Economics, History, Philosophy, Political Science, Psychology, or Sociology.)
2. **Law and Society requirements** (36 units)

- a) PHIL 007 or PHIL 007H
- b) LWSO 100
- c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
- d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
- e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
- f) LWSO 193, Senior Seminar

**Note** For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (specified departmental requirements and Law and Society requirements).

## Minor

The minor in Law and Society has the following requirements.

1. Upper Division (six courses [at least 24 units])
  - a) LWSO 100
  - b) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
  - c) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, PHIL 164, LWSO 175 (E-Z), POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Upper-Division Courses

**LWSO 100. Introduction to the Study of Law and Society (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the interdisciplinary study of the role of law and legal institutions in society. Examines the role of criminal, tort, contract, constitutional, or other areas of the law in society from different disciplinary perspectives. Credit is awarded for only one of LWSO 100 or LWSO 100H.

**LWSO 100H. Honors Introduction to the Study of Law and Society (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Honors course corresponding to LWSO 100. An introduction to the interdisciplinary study of the role of law and legal institutions in society. Examines the role of criminal, tort, contract, constitutional, or other areas of the law in society from different disciplinary perspectives. Satisfactory (S) or No Credit (NC) grading is not avail-

able. Credit is awarded for only one of LWSO 100 or LWSO 100H.

### LWSO 175 (E-Z). Topics in Law and Society (4)

Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): LWSO 100 or LWSO 100H; upper-division standing. Addresses current topics in law and society.

**LWSO 180A. Symposium in the Law (1)** Seminar, 10 hours per quarter. Prerequisite(s): upper-division standing; consent of instructor in the preceding quarter. A discussion of legal matters of common interest, in conjunction with experts from outside the university. Graded In Progress (IP) until LWSO 180A, LWSO 180B, and LWSO 180C are completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. After completing LWSO 180A, LWSO 180B, and LWSO 180C, students may repeat the sequence once for credit; total credit for each course may not exceed 2 units.

**LWSO 180B. Symposium in the Law (1)** Seminar, 10 hours per quarter. Prerequisite(s): LWSO 180A. A discussion of legal matters of common interest, in conjunction with experts from outside the university. Graded In Progress (IP) until LWSO 180A, LWSO 180B, and LWSO 180C are completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. After completing LWSO 180A, LWSO 180B, and LWSO 180C, students may repeat the sequence once for credit; total credit for each course may not exceed 2 units.

**LWSO 180C. Symposium in the Law (1)** Seminar, 10 hours per quarter. Prerequisite(s): LWSO 180B. A discussion of legal matters of common interest, in conjunction with experts from outside the university. Graded Satisfactory (S) or No Credit (NC). After completing LWSO 180A, LWSO 180B, and LWSO 180C, students may repeat the sequence once for credit; total credit for each course may not exceed 2 units.

**LWSO 192. Science and Law (4)** Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; term paper, 1 hour. Prerequisite(s): LWSO 100 or LWSO 100H. Discusses the intersection between science and law. Also compares legal and scientific procedures and decision making.

### LWSO 193. Senior Seminar in Law and Society (4)

Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): LWSO 100 or LWSO 100H; senior standing in Law and Society/Anthropology, Law and Society/Economics, Law and Society/History, Law and Society/Philosophy, Law and Society/Political Science, Law and Society/Psychology, or Law and Society/Sociology. Aims to synthesize multidisciplinary perspectives and knowledge provided by other courses in the Law and Society Program through readings, group discussion, and research on an issue or problem in law and society. Covers topics such as law and morality, law and social change, law and religion, and law and culture. Satisfactory (S) or No Credit (NC) grading is not available.

### LWSO 198-I. Individual Internship in Law and Society (4-8)

Consultation, 1-2 hours; term paper, 3-6 hours; internship, 8-16 hours. Prerequisite(s): LWSO 100 or LWSO 100H; consent of instructor and department chair; upper-division standing. An individual internship in the professional legal or policy-making community. Requires a substantive paper relating the internship to the student's area of study. Course is repeatable to a maximum of 16 units.

# Lesbian, Gay, Bisexual, Intersexual, and Transgender Studies Minor

## Subject abbreviation: LGBS

## College of Humanities, Arts, and Social Sciences

James Tobias, Ph.D., Co-Chair  
 Traise Yamamoto, Ph.D., Co-Chair  
 Program Office, 3111 INTS  
 (951) 827-3456  
[lgbtstudies.ucr.edu](http://lgbtstudies.ucr.edu)

## Committee in Charge

Byron Adams (Music)  
 Alicia Arrizon (Women's Studies)  
 Amalia Cabezas (Women's Studies)  
 Piya Chatterjee (Women's Studies)  
 Jennifer Doyle (English)  
 Erica Edwards (English)  
 Katja Guenther (Sociology)  
 George Haggerty (English)  
 Keith Harris (Media & Cultural Studies)  
 Tammy Ho (Women's Studies)  
 Marian Lam (Comparative Literature and Foreign Languages)  
 Robert Latham (English)  
 Tiffany Ana Lopez (English)  
 Molly McGarry (History)  
 Erika Suderberg (Art)  
 Carole-Anne Tyler (English)  
 Jane Ward (Women's Studies)  
 Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

The program reflects current critical, theoretical, and methodological developments across several disciplines that focus on lesbian, gay, and bisexual issues. Lesbian, Gay, Bisexual, Intersexual, and Transgender Studies are by nature interdisciplinary, and this program is meant to encourage new cross-disciplinary research in the field for interested students in the College of Humanities, Arts, and Social Sciences. The curriculum addresses such issues as sexual identity and orientation; gay, lesbian, and bisexual representation; gay, lesbian, and bisexual perspectives on the arts; retheorizations of gender; sexuality and cultural diversity; intersections of sexualities and ethnic identities.

Requirements for the minor (24 units)

1. Lower-division requirements (4 units) chosen from WMST 001 or LGBS 001
2. Upper-division requirements (20 units):
  - a) Four (4) units of English chosen from ENGL 122 (E-Z)/LGBS 122 (E-Z), ENGL 143 (E-Z)/LGBS 143 (E-Z)/MCS 143 (E-Z), ENGL 144 (E-Z)/MCS 144 (E-Z)
  - b) Four (4) units from Ethnic Studies or History chosen from ETST 175/WMST 175, HISA 130/WMST 130, HISA 132/WMST 132, HISA 133/WMST 133, HISE 148A, HISE 148B, HIST 191T

- c) Four (4) units of Art History, Classics, Dance, or Music chosen from AHS 182, AHS 186/MCS 186, CLA 120E, DNCE 131/WMST 127, LGBS 153/MUS 153, MUS 114, MUS 126/ANTH 177/WMST 126
- d) Four (4) units of Psychology, Sociology, or Women's Studies chosen from PSYC 160A, PSYC 160B, PSYC 161, SOC 140, SOC 141, SOC 153, SOC 177E, WMST 100, WMST 103/ANTH 145, WMST 108/PHIL 108, WMST 135, WMST 140/ANTH 147, WMST 152/LGBS 152, WMST 189
- e) Four (4) additional units chosen from those listed above or LGBS 190 or LGBS 193

**Note** Students may satisfy an upper-division requirement by completing 4 units of LGBS 198-I (Internship).

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for information on minors.

## Lower-Division Course

**LGBS 001. Introduction to Lesbian, Gay, Bisexual, and Transgender Studies (4)** Lecture, 3 hours; extra reading, 3 hours. Introduces students to basic issues in lesbian, gay, bisexual, and transgender studies. Topics include the history of sexuality, identity politics and community activism, the relation between sexuality and gender, the theories of sexual identity, and the globalization of lesbian, gay, bisexual, intersexual, and transgender issues.

## Upper-Division Courses

**LGBS 105. Topics in Queer Art, Culture, or Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper division standing or consent of instructor. An introduction to topics of contemporary importance in the field of Lesbian, Gay, Bisexual, Intersex, and Transgender Studies. Emphasizes different areas of study in the humanities, arts, and social sciences. Course is repeatable to a maximum of 8 units as topics change.

**LGBS 122 (E-Z). Literature and Sexualities (4)** Lecture, 3 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of English and American literature from the perspective of sexuality and sexual identity. Courses cover issues such as gay and lesbian texts and contexts; sexual ideologies and literature; marginalized writers and texts; and the uses of theories of sexualities in the study of literature. Cross-listed with ENGL 122 (E-Z).

**LGBS 128. Critical Approaches to Heterosexuality (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 3 hours. Prerequisite(s): LGBS 001 or WMST 001 or WMST 001H. Examines the late nineteenth-century origins and twentieth-century evolution of the meaning of heterosexuality in the United States. Includes the medical, psychological, and political history of heterosexuality; the race and gender components of heterosexuality; and the intersections of heterosexuality and queerness. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with WMST 128.

**LGBS 134. Queer Identities and Movements in the United States (4)** Lecture, 3 hours; extra reading, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines important twentieth- and twenty-first century developments in queer culture and activism in the United States. Focuses on the origins of sexual identity; the relationship between sexuality, race, and gender; queer representation in art and media; and central issues in queer theory. Cross-listed with WMST 134.

**LGBS 135. Love, Desire, and Lesbian Sexuality (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Expands upon the notion of lesbian identification and sexuality. Emphasizes the influence of feminism on the interdisciplinarity of lesbian studies and the complexity of lesbianism across class, race, ethnic, age, and national and international differences. Cross-listed with WMST 135.

**LGBS 137. Critical Queer Politics (4)** Lecture, 3 hours; individual study, 2 hours; written work, 1 hour. Prerequisite(s): WMST 001 or WMST 001H or consent of instructor. Presents Euro-American configurations of modern sexuality to map queer communities and homosexual presence across time and space. Critically explores the invisibilities, injustices, erasures, distortions, silences, and voices produced as a result of queer mobility, global gay and global queer liberation. Cross-listed with WMST 137.

**LGBS 139. Coming Out and Sexual Identity (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 2 hours. Prerequisite(s): LGBS 001 or WMST 001 or WMST 001H or consent of instructor. Examines speech acts, secrecy, and silence to understand the significance of the closet. Explores perspectives on resistant movements and modes of communication related to coming out. Considers coming out stories, biographies, examinations of the social construction of heterosexual identities and formation of public space. Cross-listed with WMST 139.

**LGBS 143 (E-Z). Gender, Sexuality, and Visual Cultures (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of gender and sexuality in film, television, and visual culture. E. Feminist Film Theory and Practice; F. Film and Gender; G. Screening the Lesbian; K. Queers that Kill. Cross-listed with ENGL 143 (E-Z) and MCS 143 (E-Z).

**LGBS 152. Theory of Gender Inequality (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): WMST 001 or WMST 001H. Studies theoretical debates regarding sex and gender differences; the origins and institutionalization of gender inequality; and the intersection of sexism, racism, and heterosexism. Cross-listed with WMST 152.

**LGBS 153. Homosexuality and Music (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Uses a topical rather than a chronological approach to investigate homosexuality on the part of composers, performers, critics, theorists, and historians and how this has shaped the history of music in the West. Cross-listed with MUS 153.

**LGBS 190. Special Studies (1-5)** Consultation, 1 hour; individual study, 2-14 hours. Prerequisite(s): upper-division standing; consent of instructor and program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 15 units.

**LGBS 193. Senior Seminar (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): senior standing or consent of instructor. Current topics in lesbian,

gay, bisexual, intersexual, and transgender studies. Students develop and present a research paper on an interdisciplinary theme or problem that has been selected by the instructor.

**LGBS 198-I. Individual Internship (1-4)** Consultation, 1 hour; term paper, 1-3 hours; internship, 2-8 hours. Prerequisite(s): upper-division standing or consent of instructor. Internship in a community or campus outreach program related to lesbian, gay, and bisexual studies. The internship is supervised by a faculty member teaching in the Lesbian, Gay, and Bisexual Studies minor and the agency or program coordinator. A final paper is required. Course is repeatable to a maximum of 12 units.

## Liberal Studies

### College of Humanities, Arts, and Social Sciences

Susan Ossman, Ph.D., Chair  
Office of Interdisciplinary Programs  
INTS 3116; (951) 827-2743;  
[www.Lsnid.ucr.edu](http://www.Lsnid.ucr.edu)

#### Committee in Charge

George Haggerty (English)  
Anne Jones (Education)  
Paul Ryer (Anthropology)  
Marylynn Yates (Environmental Science)  
Stephen E. Cullenberg, Ph.D.,

*Dean, College of Humanities, Arts and Social Sciences, ex officio*

## Major

Liberal Studies is the major of choice for students interested in careers in elementary school education. Under the federal legislation No Child Left Behind all prospective teachers must be "highly qualified" by demonstrating proficiency in their subject matter. The Liberal Studies major includes a core of lower-division courses designed to provide students with broad subject matter coverage to give them the foundation needed to pass the CSET and enable them to be well-prepared to teach. The five upper-division tracks allow students to build upon their strengths and interests and at the same time provide them with a connection to the core Education courses.

## Preparation for Teaching

The **Prepare to Teach Program** is a pre-professional program open to undergraduates in all majors who are interested in teaching in California elementary schools. Through the program, prospective teachers begin to think pedagogically about subjects they are studying, gain early field experience in the schools, and receive an introduction to the profession that will help them make informed decisions about their own careers. The goal is to give prospective elementary school teachers information about state requirements that are best met when students are undergraduates and to advise on how to prepare to teach the required subjects in California elementary schools. The program is administered in the Office of Interdisciplinary Programs, 2417 Humanities and Social Sciences, (951) 827-2743.

**Blended Program in Undergraduate Teacher**

**Preparation** Qualified students have the opportunity to enroll in an accelerated program resulting in an elementary credential. The end goal is to be able to begin “professional” student teaching in the final quarter of the senior year. Our goal is to give early deciders the opportunity to begin teaching their own classes earlier and as interns to continue to receive the intense support of the Graduate School of Education and the school district during the first two quarters of the first year of teaching.

Students must take EDUC 001 and EDUC 002. Successful completion also requires careful course selection and a minimum GPA of 3.0. Advising is a collaborative effort between the Bridge to Teaching Program and the Graduate School of Education. For information about undergraduate requirements, contact Brenda Aragon in the Office of Interdisciplinary Programs, 2417 Humanities and Social Sciences, (951) 827-2743, or [brenda.aragon@ucr.edu](mailto:brenda.aragon@ucr.edu). Information about UCR's credential programs can be found at the Graduate School of Education Web site, [education.ucr.edu/teach](http://education.ucr.edu/teach) or at 1124 Sproul Hall.

**University Requirements**

See Undergraduate Studies section.

**College Requirements**

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

**Major Requirements**

The major requirements for the B.A. degree in Liberal Studies are as follows:

1. Lower-division requirements (20 courses [at least 80 units]). Courses can be used to fulfill college breadth requirements.
  - a) Science and Mathematics (6 courses [at least 24 units]): BIOL 002, BIOL 003, GEO 002, one course in physics, one course in chemistry, and one of MATH 004, MATH 005, MATH 008A, or MATH 015.
  - b) Humanities and Fine Arts (7 courses [at least 28 units]): CPLT 017A, DNCE 005, RLST 012/ETST 012, one of ART 001, ART 002, or ART 005, one of MUS 006/ANTH 006 or MUS 014/ETST 014/URST 014, one of ENGL 014 or ENGL 020B, and one of CRWT 056, THEA 010, or THEA 070.
  - c) History and Social Science (8 courses [at least 32 units]): ANTH 001, HIST 010, HIST 015, HIST 017A, LING 020, POSC 010, SOC 001, WMST 001
2. Upper-division requirements: 8 courses (at least 32 units).
  - a) One course in American Literature from: ENGL 130, ENGL 131, ENGL 132, ENGL 133, ENGL 134, ENGL 136T, ENGL 137T, ENGL 138A, ENGL 138B, ENGL 138T
  - b) One course in Ethnicity or Gender from: ETST 100, ETST 101A, ETST 102, ETST 111, ETST 121, ETST 131, WMST 100, WMST 101, WMST 108/PHIL 108, WMST 126/ANTH 177/MUS 126, WMST 132/HISA 132, WMST 149/ANTH 149, WMST 161
  - c) One course in United States History or United States Government from: HISA 110A, HISA 110B, HISA 110C, HISA 113, HISA 114, HISA 115, HISA 116, HISA 117A, HISA 117B, HISA 120A, HISA 120B, HISA 135/ETST 112, POSC 100, POSC 101, POSC 113
  - d) One Course in Communication Studies from: ANTH 113, ANTH 120, ANTH 123, ANTH 131, ANTH 165, ANTH 177/ MUS 126/WMST 126, ART 131/MCS 131, ART 135/MCS 135, ART 139, ART 140, ART 145, ART 150/MCS 150, ART 155, ART 167, ART 168, ART 169 (E-Z), AHS 182, AHS 186/MCS 186, AHS 187/MCS 187, CRWT 130, CRWT 165, CRWT 166A/MCS 166A/THEA 166A, CRWT 174, CRWT 176 (E-Z), ECON 111, ECON 116, ECON 117/PHIL 119, ECON 119, ECON 123/HISA 123, ENGL 103, ENGL 143 (E-Z)/MCS 143 (E-Z), ENGL 144 (E-Z)/ MCS 144 (E-Z), ENGL 145 (E-Z)/MCS 145 (E-Z), ENGL 146 (E-Z)/MCS 146 (E-Z), MCS 110 (E-Z), MCS 114/CPLT 134/GER 134/JPN 134, MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 125 (E-Z)/LNST 125 (E-Z)/ SPN 125 (E-Z), MCS 131/ART 131, MCS 133/SOC 138, MCS 136/ART 136, MCS 137/AHS 136, MCS 150/ART 150, MCS 160/ART 160, MCS 172, MCS 173 (E-Z)/ CPLT 173 (E-Z), MUS 126/ANTH 177/ WMST 126, MUS 140/HISA 139, PHIL 108/WMST 108, PHIL 111, PHIL 112, PHIL 116, POSC 146, PSYC 134, PSYC 150, SOC 120, SOC 121, SOC 122, SOC 133, SOC 134, SOC 139/MCS 139, SOC 140, SOC 141, SOC 143/URST 143, SOC 156, SOC 157, SOC 173, SOC 174, SOC 175, THEA 109/ANTH 109, THEA 110A, THEA 110B, WMST 103/ANTH 145, WMST 108/PHIL 108, WMST 109/ANTH 109, WMST 149/ANTH 149, WMST 150/ANTH 158
  - e) One Course with a Global Perspective from: ANTH 104, ANTH 105/BUS 158, ANTH 107, ANTH 112, ANTH 118, ANTH 122, ANTH 127, ANTH 130/DNCE 130, ANTH 132, ANTH 135, ANTH 140 (E-Z), ANTH 158, ANTH 159, ANTH 160, ANTH 161/LNST 161, ANTH 162, ANTH 163, AHS 102/ANTH 102, AHS 113, AHS 115/LNST 115, AHS 182, AHS 187/MCS 187, ECON 124, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 146/URST 146, ECON 153/BUS 153, ECON 156, EDUC 114, LNST 164/ANTH 164/WMST 164, LNST 168/ANTH 168/ETST 148, LNST 185/ECON 185, LNST 187/ECON 187, PHIL 108/WMST 108, PHIL 110, PHIL 117, PHIL 119/ECON 117, PHIL 152, PHIL 163, PHIL 167, POSC 110, POSC 111, POSC 116, POSC 124, POSC 125, POSC 126, POSC 127, POSC 129, POSC 150, POSC 152, POSC 153, POSC 154, POSC 155, POSC 157, POSC 158/LNST 148, POSC 159, POSC 160, POSC 162/LNST 142, POSC 169, POSC 182, PSYC 140, RLST 111, RLST 116, RLST 118, RLST 124 (E-Z), RLST 138/LNST 138, RLST 139, RLST 150, RLST 151, RLST 160/WMST 160, RLST 170, RLST 174, RLST 175, SOC 123, SOC 133, SOC 134, SOC 135, SOC 137, SOC 139/MCS 139, SOC 150, SOC 151, SOC 156, SOC 157, SOC 161, SOC 181, SOC 182/URST 182, SOC 184, WMST 109/ANTH 109, WMST 126/ANTH 177/MUS 126, WMST 140/ANTH 147, WMST 141/PHIL 168, WMST 149/ANTH 149, WMST 150/ANTH 148, WMST 155/ECON 155, WMST 156, WMST 160/RLST 160, WMST 161, WMST 164/ANTH 164/LNST 164, WMST 175/ETST 175, WRLT 170/ETST 170
  - f) Three additional courses from the areas above.
3. Education Component: 5 courses (at least 18 units): EDUC 100B, EDUC 109, EDUC 139, EDUC 172, EDUC 177A

# Management

**Subject abbreviation: MGT**

**The A. Gary Anderson**

**Graduate School of Management**

Yunzeng Wang, Ph.D.,  
Dean (Acting); Associate Dean for  
Academic Programs  
Rami Zwick, Vice Dean  
School Office, 162 Anderson Hall  
(951) 827-6329; [www.agsm.ucr.edu](http://www.agsm.ucr.edu)  
Richard Savich, Ph.D., Academic Director,  
Palm Desert Graduate Center  
UCR Palm Desert campus  
[www.palmdesert.ucr.edu](http://www.palmdesert.ucr.edu)

## Professors

Y. Peter Chung, Ph.D. (Finance)  
Bajis M. Dodin, Ph.D. (Operations and Supply  
Chain Management)  
Mohsen El-Hafsi, Ph.D. (Operations and Supply  
Chain Management)  
Donna Hoffman, Ph.D. *Albert O. Steffey Professor  
of Marketing* (Management and Marketing)  
Sarkis J. Khoury, Ph.D. (Finance)  
Woody M. Liao, Ph.D. (Accounting and Information  
Systems)  
Birendra Mishra, Ph.D. (Accounting and  
Information Systems)  
Theodore Mock, Ph.D. *Distinguished Professor*  
(Accounting and Information Systems)  
Michael Moore, Ph.D. (Accounting and Information  
Systems)  
Thomas Novak, Ph.D. (Management and  
Marketing)  
Amnon Rapoport, Ph.D. *Distinguished Professor of  
Management* (Management and Marketing)  
Waymond Rodgers, Ph.D. (Accounting and  
Information Systems)  
Erik Rolland, Ph.D. (Accounting and Information  
Systems)  
Richard Smith, Ph.D. *Philip L. Boyd Chair*  
(Finance)  
David Stewart, Ph.D. *Distinguished Professor of  
Marketing* (Management and Marketing)  
Yunzeng Wang, Ph.D. *Dean's Distinguished  
Scholar* (Operations and Supply Chain  
Management)  
Rami Zwick, Ph.D. (Management and Marketing)

## Professors Emeriti

David Mayers, Ph.D. (Finance)  
Kathleen Montgomery, Ph.D. (Management and  
Marketing)

## Associate Professor

Jorge Silva-Risso, Ph.D. (Management and  
Marketing)

## Associate Professor Emeritus

Lawrence Zahn, Ph.D. (Management and  
Marketing)

## Assistant Professors

Cecile Cho, Ph.D. (Management and Marketing)  
Long Gao, Ph.D. (Operations and Supply Chain  
Management)  
Andrea Godfrey, Ph.D. (Management and  
Marketing)  
Sukwon (Thomas) Kim, Ph.D. (Finance)  
Seok-Woo Kwon, Ph.D. (Management and  
Marketing)  
Yun Liu, Ph.D. (Finance)  
Xing Pan, Ph.D. (Management and Marketing)

\*\*

## Lecturers

Francisca Beer, Ph.D. (Finance)  
Rafiqul Bhuyan, Ph.D. (Finance)  
Essia Hamouda, Ph.D. (Accounting and  
Information Systems)  
Sean Jasso, Ph.D. (Management and Marketing)  
Rosemary Kim, Ph.D. (Accounting and Information  
Systems)  
David Kung, Ph.D. (Operations and Supply Chain  
Management)  
Mohammad Oskoorouchi, Ph.D. (Operations and  
Supply Chain Management)  
Gary Patterson, J.D. (Accounting and Information  
Systems)  
Bruce Samuelson, D.B.A. (Accounting and  
Information Systems)  
Iryna Shevchuk, Ph.D. (Management and  
Marketing)  
Raj Singh, Ph.D. (Management and Marketing)  
Craig Weaver, M.B.A. (Accounting and Information  
Systems)

## Graduate Program

Through The A. Gary Anderson Graduate School of Management, The School of Business Administration (SoBA) offers two professional graduate programs leading to the Master of Business Administration (M.B.A.) degree. The Master of Business Administration (M.B.A.) program is offered at the UCR campus. The school also offers an Executive Master of Business Administration (E.M.B.A.) program at the UCR Palm Desert Graduate Center.

**Admission** Applications for the traditional M.B.A. program are accepted for fall, winter, and spring entry. The program is open to eligible students from all undergraduate majors. Quantitative methods (business calculus, linear algebra) is a prerequisite to the program. Qualified students who have not taken this prerequisite course may be admitted, but must meet this requirement during their first two quarters in residence. Admission to the graduate program is based on several criteria including the quality of previous academic work, scores on the Graduate Management Admission Test (GMAT) or General Record Examination (GRE), letters of recommendation, and managerial experience.

Applications for the Executive M.B.A. program are accepted throughout the year for fall entry only. Successful candidates should demonstrate progressive personal achievement including leadership ability and experience, particularly mid- to senior-level professionals who have the opportunity to complete the E.M.B.A. program on alternative weekends (Fridays and Saturdays) over a 20-month period without interrupting their career.

**Course Work** The M.B.A. program can be completed in two years on a full-time basis or in three to four years on a part-time basis. In the 80-unit program (20 courses), all students take 36 units in a common body of knowledge that consists of courses in quantitative analysis, managerial economics, financial accounting, finance, operations and management science, information systems, organizational behavior and theory, strategic management, and marketing

management. Thereafter, students complete a required internship, 28-36 units selected from electives, a management synthesis course, and a thesis or an industry-based case project (in the management synthesis class MGT 238). All students must complete a non-degree credit workshop in communications, leadership, teams, and ethics.

Electives are selected with the assistance of a faculty advisor to meet individual educational and career goals. Electives are offered in areas such as accounting, entrepreneurial management, finance, human resources management, international management, management science, management information systems, marketing, and production and operations management. The program is flexible to meet individual student interests, and students are also encouraged to take courses in related disciplines such as economics, statistics, computer science, and sociology.

The school has a working agreement with the Department of Psychology for collaborative training of doctoral students in consumer behavior/marketing

**Normative Time to Degree for Both Programs**  
7 quarters.

## Master of Business Administration

Candidates for the M.B.A. are required to complete all the general requirements specified in the Graduate Studies section of this catalog.

The program conforms to Plan I or Plan II.

**Plan I (Thesis)** For thesis work, a maximum of 8 units of credit is granted. The thesis is a two or more quarter research endeavor to be initiated during a student's final year in the program. It is expected that most students will develop theses related to advanced work in their electives. The format and other details of the thesis must meet the requirements of the Graduate Division of UCR.

**Plan II (Comprehensive Examination)** Students who elect Plan II must complete an industry-based group case analysis as part of the management synthesis course. This case serves in lieu of a comprehensive final examination. Students whose case analyses are deemed "not acceptable" are given one additional quarter to revise them to an "acceptable" level.

## Executive Master of Business Administration Program

The E.M.B.A. program is a self-supported program that is offered at the Richard J. Heckmann International Center for Entrepreneurial Management at the UCR Palm Desert Graduate Center (PDGC) with three one-week residential courses. The first residential permits students to become acquainted with their academic community; they are assigned to balanced work-study groups. The second residential is an international trip set during the middle of the program designed to expose students to current "Global Strategy" as well as

other economic issues. The final residential concludes the program by focusing on individual professional development planning strategies. Successful completion of this program results in the awarding of the M.B.A. degree.

This program focuses on an interdisciplinary structure with a specific focus on general management. Admission is based on an assessment of all materials gathered through the application process. These materials include and are not limited to official transcripts, test scores, professional experience, letters of recommendation, and a personal interview for admission into the E.M.B.A. program.

**Course Work** E.M.B.A. courses and program events are open for enrollment and participation only for those students admitted to the E.M.B.A. program. A student may not receive credit for an E.M.B.A. course unless admitted into the E.M.B.A. Program.

The course work for the E.M.B.A. program is designed to be completed in less than 20 months. This is a full-time program attended in an accelerated fashion. Candidates spend extended time in the classroom with fewer visits to campus. The E.M.B.A. program requires a total of 80 units with a minimum grade point average of 3.0 in the core and overall. All students must complete a nondegree credit workshop in communications, leadership, teams, and ethics.

Common Core Courses are identified as the following: Organizational Behavior, Information Systems, Financial Accounting, Statistics, Managerial Economics, Marketing, Financial Management, Operations Management, Business Policy & Strategy, Entrepreneurial Management, Corporate Finance & Investment, Human Resource Management, Marketing Strategy, Logistics & Supply Chain Management, and Negotiation for Managers.

Electives in the second year are drawn from traditional functional areas and emerging business themes, such as: Supply Chain Management, Web Commerce, Empirical Finance, Audit & Assurance, and Behavior Decision Research.

**Executive Coaching** The E.M.B.A. program uses a common background of group and individual coaching to integrate course materials, improve learner effectiveness, and create a career action plan. At the conclusion of the program, student action plans are presented.

## Interdepartmental Graduate Program in Management (IGPM)

The Interdepartmental Graduate Program in Management offers both the Master of Arts (M.A.) degree (comprehensive examination Plan II) and the Doctor of Philosophy Degree (Ph.D.). Concentrations are offered in two major field areas:

- Marketing
- Strategic Management and Organizations (SMO)

The Interdepartmental Graduate Program in Management (IGPM) trains doctoral students in the design and execution of original research in Management. While an M.A. degree may be earned en route to the Ph.D., admissions will only be to the Ph.D. program.

Distinctive features of the IGPM program include: 1) a strong cross-disciplinary focus over and above the multi-departmental structure of SoBA; 2) the opportunity for Ph.D. students to focus on areas of strength in internet marketing, modeling, and decision making; and 3) research support from the UCR Sloan Center for Internet Retailing

**Admissions** Applicants will be expected to have completed a bachelor's degree at a four-year accredited college or university and to have attained an undergraduate academic record that satisfies the standards established by the Graduate Division, University of California, Riverside. In addition to the following requirements, all applicants must meet the general requirements as set forth in the Graduate Studies section of the General Catalog.

A prior business degree is not a requirement. However, if a student has no previous business coursework, he/she must consult with the Graduate Advisor about whether any coursework in the major field area will be necessary.

Applicants will be required to submit official GMAT or GRE exam scores. Preference for one exam is not given over the other. All applicants whose first language is not English must also submit an acceptable TOEFL test score prior to admittance. The successful applicant is expected to score at least 560 on the paper exam or 220 on the computer based exam, or 80 on the TOEFL iBT. Applications are accepted for admission for Fall Quarter.

**Language Requirement** There is no foreign language requirement, but students who wish to TA must pass an English language proficiency exam.

**Plan II (Comprehensive Examination)** The M.A. Degree, Plan II, requires completing a minimum of 36 units of approved graduate-level coursework and passing the comprehensive examination at least at the M.A. level. The comprehensive examination will be prepared and administered by the Graduate Examination Committee. The comprehensive examination will cover a broad range of topics chosen from the core research, major field, and elective graduate courses taken by the student in their first two years of study. Students must be in residence for 3 quarters.

UCR will not award M.A. degrees to students already possessing an M.A. in Management.

For the Ph.D. degree, students must satisfy all requirements for the M.A. degree, complete additional Ph.D. course requirements, fulfill the university residency requirement of 6 quarters, have an overall GPA of 3.0, pass the Ph.D. qualifying exam, successfully defend their dissertation, and have an approved dissertation.

### Required/Elective Courses & Required Research

- *Required Research Methods Courses (5 courses)*
- *Required Field Seminars (4 seminars)*
- *Basic Discipline Courses (3 courses)*
- *Electives (4 courses)*
- *Field Colloquium (required until the student advances to Ph.D. candidacy)*
- *First Year Research Paper*

This program consists of a total of 16 courses and a field colloquium course each quarter until the student advances to candidacy. Each of these requirements is detailed below.

#### Required Research Methods Courses (5 courses)

The required research methods courses are intended to provide the student with a strong foundation in research methodology. All students, regardless of major field area, will choose from the same pool of potential core research courses. The student typically takes one or two courses covering traditional statistical methods, and two or three courses covering more advanced topics. Students who wish to have courses waived must first obtain the approval of the Graduate Advisor and then the Graduate Dean.

#### Required Field Seminars (4 seminars) Ph.D.

students are required to complete a set of four field seminars in their major field area (either Marketing or SMO). For each major field area, two field seminars are taught each year. A given field seminar is taught every other year. Thus, in the first two years of study, a Marketing or SMO Ph.D. student would take all four field seminars in their area of study.

**Basic Discipline Courses (3 courses)** It is important that Ph.D. students develop a deep understanding of a basic discipline related to their major field area. Thus, students are required to complete three graduate-level courses from a department outside of SoBA.

Courses eligible for the basic discipline course requirement include: a) any of the research methods courses not taken to meet the research methods requirement, b) any of the courses listed as an approved elective, or c) any other graduate-level course or independent study approved by the Graduate Advisor.

**Electives (4 courses)** Four additional graduate-level elective courses are required. Courses eligible as electives include: a) any of the research methods courses not taken to meet the research methods requirement, b) any of the courses listed as approved elective, c) a Field Seminar from a different major field area, or d) any other graduate level course or independent study approved by the Graduate Advisor.

**Field Colloquium (required until the student advances to Ph.D. candidacy)** It is essential that Ph.D. students actively participate in the intellectual life of the school. To facilitate this, field colloquia will be offered each quarter, and Ph.D. students will be required to formally participate in these field colloquia for course credit until they pass their dissertation proposal

defense and advance to Ph.D. candidacy.

**First Year Research Paper** Ph.D. students must complete a research paper of publishable quality during their first year. The student's Faculty Advisor works with the student to develop the research topic, set expectations, and provide feedback. A three-person committee consisting of the student's Faculty Advisor, plus two additional program faculty appointed by the Graduate Advisor, evaluates the submitted paper.

**Field Examinations (Comprehensive Examination)** The comprehensive examination serves as both a major field examination, as well as an examination of topics covered in core research courses. Subsequent to the comprehensive examination, the Graduate Examination Committee will issue a grade of passing at the Ph.D. level, passing at the M.A. level, or failing. Students who pass the comprehensive examination at the Ph.D. level may receive an M.A. in Management (if they do not already hold an M.A. in Management), and will be permitted to continue with the Ph.D. program. If, in the first attempt, a student fails the comprehensive examination or passes at the M.A. level, he or she may retake the examination at the next scheduled comprehensive examination date. No more than two attempts to pass the comprehensive examination are allowed. Students who pass only at the M.A. level will be recommended for a Master's Degree (if they do not already hold an M.A. in Management), and will not be permitted to continue with the Ph.D. program. The comprehensive exam should be taken no later than the end of the sixth quarter.

**Qualifying Examinations (Dissertation Proposal Defense)** When all requirements are completed, students take their oral qualifying exam, which is a defense of the dissertation proposal. Conducted by the Ph.D. Qualifying Committee, the exam is based upon the student's dissertation proposal, and includes a broad inquiry into the student's preparedness to conduct research and provides an opportunity to discuss the proposed dissertation. After completing the oral qualifying examination and all course requirements successfully, the student is formally advanced to candidacy. All students should advance by the end of their 7th quarter.

**Dissertation** The dissertation culminates the student's academic endeavors. Of substantial magnitude, the dissertation should make a significant contribution to the advancement of knowledge in the chosen field of study.

**Final Examination (Dissertation Defense)** A candidate for the degree of Ph.D. may be asked to defend his or her dissertation in a public, oral presentation at a time announced to members of the University community. Upon the candidate's successful defense of the dissertation, the Ph.D. Dissertation Committee will make a recommendation to the Graduate Division that the Ph.D. degree be conferred. The dissertation must be filed with the Graduate Division according to their formatting requirements.

**Normative time** The normative time to complete the Ph.D. is 5 years.

## Graduate Courses

### **MGT 200. Organizational Behavior and Theory (4)**

Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 404 or consent of instructor. Enhances student understanding of complex organizational life using multiple perspectives at the micro and macro levels. Addresses theories and research pertaining to organizational structure, culture, group dynamics, interpersonal relations, and social psychological factors with the goal of developing students' capabilities for diagnosing organizational problems and identifying appropriate solutions.

**MGT 201. Quantitative Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MGT 403 or equivalent; familiarity with Microsoft's Excel spreadsheet software. Addresses the process of generating decision-making information from data and solving management problems using common computer tools. Covers problem identification and formulation, model selection and use, and interpretation of the results of statistical analysis. Topics include estimation, hypothesis testing, analysis of variance, simple and multiple regression, time series, and forecasting. May not be taken for degree credit by students in statistics undergraduate or graduate programs.

**MGT 202. Financial Management (4)** Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): graduate standing or consent of instructor; MGT 201 (may be taken previously or concurrently), MGT 211 (may be taken previously or concurrently) or equivalents. Provides a foundation in theories of finance. Topics include time value of money, security valuation, financial institutions, theories of risk measurements, managing a firm's investment decisions, capital structure, and sources of financing for a firm.

**MGT 203. Economics for Management (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MGT 403 or equivalent. A study of the use of microeconomics and macroeconomics in managerial decision making. Topics include demand and supply, production and cost functions, competition, labor supply, national income accounting, aggregate output, interest rates, fiscal and monetary policy, inflation, economic growth, and business cycles.

**MGT 204. Cost and Management Accounting (4)** Lecture, 3 hours; outside projects, 3 hours. Prerequisite(s): MGT 211 or equivalent. A study of accounting information for managerial planning and control. Topics include managerial applications for product costing, budgeting, and performance evaluation; accounting techniques for modern manufacturing systems; activity-based accounting and cost management; international cost accounting systems; and the behavioral implications of accounting information.

**MGT 205. Information Systems (4)** Lecture, 3 hours; laboratory, 1 hour; outside projects and extra reading, 2 hours. Prerequisite(s): graduate standing; familiarity with basic computer operations and software packages. Examines the operation and management of information systems as applied to the business environment. Topics include hardware, software, databases, decision support, and systems analysis. Software packages are used to integrate information systems concepts and business applications.

**MGT 207. Operations Management for Competitive Advantage (4)** Lecture, 3 hours; outside projects and extra reading, 3 hours per week. Prerequisite(s): MGT 201, spreadsheet skills. Focuses on managing the activities involved directly in the creation of products and services, such as design, production, and distribution. Provides managers with the skills and tools to

analyze, optimize, and improve production processes for competitive advantage. Explores issues through lectures, cases, and videos pertaining to various industries.

### **MGT 208. Business, Government, and Society (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Provides a managerial perspective on the relationship between business and its external stakeholders. Primary focus is on the impact of public policy on business and the management of public issues in a global environment. Case studies and teamwork are emphasized.

**MGT 209. Marketing Management (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MGT 403 or equivalent. Analyzes the marketing process, the environment within which it operates, institutions involved, and the functions performed. Examines the relationships and trends in a market-based economic system. Develops concepts and terms applied to marketing decisions from the perspective of a manager.

**MGT 210. Human Resources Management (4)** Lecture, 3 hours; outside projects and reading, 3 hours. Prerequisite(s): MGT 200. Introduces methods for managing the firm's human resources within the context of regulatory and economic conditions and changing workforce demographics. Topics include recruitment and selection, compensation and reward systems, employee development and appraisal, and information systems for meeting HRM objectives.

**MGT 211. Financial Accounting (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers financial accounting concepts and the analytical tools needed to understand and interpret financial statements. Examines the uses of financial accounting information.

**MGT 215. International Comparative Management (4)** Lecture, 3 hours; outside projects and readings, 3 hours. Prerequisite(s): graduate standing. Comparative analysis of significant management practices. The impacts of cultural, political, social, and economic factors on decision making within the international arena are examined.

**MGT 216. Managing a Diverse Work Force (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MGT 200 or consent of instructor. Covers management issues arising from a work force that is increasingly diverse in terms of gender, race, age, ethnicity, culture, and health status. Topics include participation patterns and career development, stereotyping, communication styles, work-family conflicts, reasonable accommodation and other legislative requirements.

**MGT 217. Management-Labor Relations (4)** Lecture, 3 hours. Prerequisite(s): MGT 210 or equivalent and consent of instructor. The social forces leading to collective employee action in public and private institutions are examined in light of labor legislation, labor law, labor economics, collective bargaining, and the aspirations of social groups.

**MGT 218. Ethics in Management (4)** Lecture, 3 hours. Examines ethical dilemmas faced by managers and organizations and extends decision analysis to include the ethical dimension present in most policy decisions. Seeks to increase the students' ability to identify and respond to ethical issues in organizations, including such areas as affirmative action, bribery, deception, working conditions, product safety, environmental impact, and international relations.

**MGT 220. Negotiations for Managers (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Develops student understanding of the theory and processes underlying a broad spectrum of negotiation problems.

Students attain competence in negotiations by applying analytic and interpersonal skills learned from readings and lectures to negotiation exercises and debriefings.

**MGT 221. Decision Making Under Uncertainty (4)**

Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 207 or consent of instructor. Introduces basic tools for using data to make informed managerial decisions under uncertainty. Addresses modeling, performance evaluation, and optimization of systems with uncertain parameters. Topics include Markov chains, Markov decision processes, and probabilistic linear and dynamic programming. Applications are drawn from operations, finance, marketing, and other management fields.

**MGT 222. Organization Development and Change (4)**

Lecture, 3 hours. Prerequisite(s): MGT 200 or consent of instructor. Stresses the initiation and management of organizational change through the use of applied behavioral science knowledge. Emphasizes the diagnosis of organizational problems followed by the development of an improved plan and the strategies and tactics for implementing that plan.

**MGT 224. Managing for Quality Improvement (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 201 or consent of instructor. Discusses the operational aspects of quality improvement in manufacturing and service organizations. Focuses on the broader issues of total quality management, statistical process control, and the difficulties in implementing quality efforts in organizations.

**MGT 225. Professional Accounting and Auditing Research (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Provides an in-depth examination of the professional accounting and auditing research process. Includes issue identification; location and evaluation of authority using online and electronic accounting, auditing, and tax research databases; developing conclusions and recommendations; and communication of research results.

**MGT 226. Fraud and Forensics Auditing (4)**

Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 204 or equivalent. Addresses forensic accounting and fraud examination in how it pertains to both civil and criminal matters. Develops a basic understanding of the characteristics of fraud, fraud prevention and detection, investigative techniques, asset recovery, and use of information technology.

**MGT 227. Fixed-Income Securities and Markets (4)**

Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 201. Covers analytical techniques related to fixed-income securities. Includes basic analytical tools in fixed-income markets. Topics include relative pricing of fixed-income securities, yield-curve estimation, securities with embedded options, and trading strategies. Utilizes interest rate swaps, mortgage-backed securities, and credit derivatives.

**MGT 228. Consumer Behavior (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MGT 209 or consent of instructor. Analyzes why people buy and examines purchase decision processes and outcomes. Studies current models of consumer behavior. Topics include brand equity, customer delight, global marketing, behavior modification, and strategic market analysis.

**MGT 229. Sustainability and Ethical Control**

**Systems (4)** Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 204 or equivalent. Discusses the role of accounting information in the design and implementa-

tion of management control systems. Emphasizes responsibility accounting and performance evaluation. Presents complex issues related to management control systems through case studies.

**MGT 230. Databases for Management (4)**

Lecture, 3 hours; outside projects and readings, 3 hours. Prerequisite(s): MGT 205. Examines the features and capabilities of database management systems, including database classification, data structures, file organizations, evaluation, and management of database systems.

**MGT 231. Corporate Finance (4)**

Lecture, 3 hours; extra reading, 1.5 hours; outside problem sets, 1.5 hours. Prerequisite(s): MGT 202. An intensive analysis of the effects of corporate financial policy decisions on firm value. Examines the interrelation of firm value, financing policy, investment decisions, and other considerations. Provides an understanding of the theoretical issues involved in the choice of these policies.

**MGT 232. Derivatives and Asset Pricing (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 202. Explores the pricing of derivatives-based securities. Covers various topics in derivatives markets. Introduces pricing techniques for forwards, futures, options, swaps, and other derivatives. Utilizes empirical data and financial modeling.

**MGT 233. Marketing Research (4)**

Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 201, MGT 209; or consent of instructor. Examines how marketing-related data is gathered from individuals and organizations. Explores the importance of integrating problem formulation, research design, questionnaire construction, and sampling so as to yield the most valuable information. Also studies the proper use of statistical methods and the use of computers for data analysis.

**MGT 235. Strategic Management (4)**

Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): graduate standing. Studies the formulation, implementation, and evaluation of business unit and corporate strategies and the organizational policies and managerial practices that support them. Applies theory to actual general management problems using cases, group exercises, and other simulations of strategic challenges.

**MGT 236. Decision Making Under Certainty (4)**

Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 207 or consent of instructor. Introduces basic tools for using data to make informed managerial decisions under certainty. Covers modeling and solution methods in network optimization, integer and nonlinear programming, and multiple criteria decision analysis. Examines applications and case studies in operations, logistics, finance, and marketing.

**MGT 237. International Financial Management (4)**

Lecture, 3 hours; extra reading, 1 hour; outside projects, 2 hours. Prerequisite(s): MGT 202. Focuses on the nature, risks, and management of foreign exchange exposure in a corporate setting. Covers trade and international investment theories. Topics include the international financial systems, balance of payments, foreign exchange markets, measurement of foreign exchange risk, hedging, international asset pricing, and trade financing.

**MGT 238. Management Synthesis (4)**

Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 200, MGT 201, MGT 202, MGT 203, MGT 205, MGT 207, MGT 209, MGT 211, MGT 235. A team-taught, integrative case course that focuses on managing the complex tasks of the total organization. Examines the interdependence of the functional areas of management. Student teams ana-

lyze cases involving several functional areas and recommend actions for improvement.

**MGT 239. Simulation for Business (4)**

Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 201, MGT 205. Introduces computer simulation as a tool for analyzing complex decision problems. Analyzes and discusses the theory and practice of modeling through simulation. Topics include modeling uncertainty and collecting input data, basic simulation principles, Monte Carlo simulation techniques, model verification and validation, and analysis of simulation output. Examines applications in manufacturing, finance, health services, and public policy.

**MGT 240A. Taxation (4)**

Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 211 or equivalent or consent of instructor. Covers federal income tax laws as they apply to individuals, partnerships, and corporations. Also discusses tax planning, tax policy, and other special tax issues.

**MGT 240B. Advanced Taxation (4)**

Lecture, 3 hours; outside case analysis, 3 hours. Prerequisite(s): MGT 240A or equivalent. Articulates advanced topics in federal taxation and tax planning. Explores many facets of the complex body of tax law including tax research, alternative minimum tax, investment losses, employee compensation, corporate distributions, and federal transfer taxes.

**MGT 241. Accounting Systems and Control (4)**

Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 204 or equivalent. A study of the design and implementation of internal control systems. Emphasizes auditing, accounting information systems, ethical and trust systems, and related issues.

**MGT 243. Product Development (4)**

Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 209 or consent of instructor. Develops a framework for the development of product concepts through new product introduction. Emphasis is given to tactical and strategic decisions in product positioning and policy. Relies on extensive computer-based analysis.

**MGT 244. Corporate Risk Management (4)**

Lecture, 3 hours; written case analyses and reports, 3 hours. Prerequisite(s): MGT 202. Provides an overview of derivative financial instruments. Focuses on the use of derivatives to manage risk in a corporate setting. Utilizes the case-method to develop strategies and policies for managing the risk exposure of an enterprise, as well as to assess the relations between risk management and value creation.

**MGT 245. Financial Statement Analysis (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 211 or consent of instructor. Explains the role of financial statement analysis in an efficient capital market. Data from financial statements of major corporations is analyzed to develop skills necessary to interpret financial accounting information. Designed for future professionals who will be intensive users of financial accounting reports (e.g., security analysts, credit analysts).

**MGT 246. Entrepreneurial Management (4)**

Lecture, 3 hours; outside projects, 3 hours. Prerequisite(s): MGT 202, MGT 209; or consent of instructor. Study of the entrepreneurial process, its challenges, and the driving forces behind it—the managerial skills, mental attitudes, and basic knowledge necessary for creating and growing a new venture. Topics include opportunity assessment; building the management team; marshalling capital and other critical resources; and harvest strategies.

**MGT 247. Advertising Management (4)** Lecture, 3 hours. Prerequisite(s): MGT 228 or consent of instructor. Examines the role and use of advertising within the marketing function. The models and research methods appropriate to the field will be explored with special attention given to objective setting, copy decisions, media decisions and budgeting. Social/economic issues are also examined.

**MGT 248. Global Marketing (4)** Lecture, 3 hours; outside research, 2 hours; extra reading, 1 hour. Prerequisite(s): MGT 209 or consent of instructor. Analyzes global markets and opportunities. Provides an understanding of global environments and the marketing management required to meet the demands of global markets in a dynamic setting.

**MGT 249. Pricing Strategy (4)** Lecture, 3 hours; consultation or discussion, 1 hour. Prerequisite(s): MGT 209 or consent of instructor. The concepts of competitive pricing, price leadership, price discrimination, price warfare, and the strategic implication of skimming versus penetration strategies with respect to the experience curve will be developed.

**MGT 250. Marketing Channels and Sales Force (4)** Lecture, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 209. Examines decisions related to distribution channels and sales force. Discusses how to select the most appropriate marketing channel. Channel management topics include distribution intensity, power, control, and channel conflict. Covers issues in sales-force management, compensation, structure, and size.

**MGT 251. Market Assessment (4)** Lecture, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 209. Examines advanced topics in marketing, with emphasis on quantitative tools to aid marketing decision making. Topics include demand and market-share forecasting, conjoint analysis, market segmentation and cluster analysis, brand positioning and competitive market structures, and assessing market response to price, advertising, promotion, distribution, and sales force.

**MGT 252. Investments and Portfolio Management (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 202. Discusses standard asset pricing models, portfolio theory, and empirical uses of securities data. Addresses pricing in the capital markets and empirical issues in testing asset pricing models. Other topics include risk-adjusted portfolio performance, term structure, bond pricing, and bond portfolio management.

**MGT 253. Internet Marketing (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 209 or consent of instructor. Examines the role of the Internet in an organization's overall marketing framework. Discusses marketing applications of personalization, traffic generation, online search, community, online experience, and other current Internet-enabled marketing techniques. Emphasizes Internet retailing.

**MGT 254. Internet Retailing Project (4)** Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 209; consent of instructor. A practical examination of the Internet retailing customer chain from a managerial perspective. Involves special-topic lectures, directed readings, active discussion, and student presentations. Culminates in a class-written book comprised of chapters focusing on team-developed solutions to industry problems. Course is repeatable to a maximum of 8 units.

**MGT 257. Marketing Strategy (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): MGT 209 or consent of instructor. A framework is developed for strate-

gic marketing planning. Topics emphasized include market audits and futures research, product-market identification, product portfolio balancing, target market strategy, and integrated marketing program planning. Relies heavily on an extensive computer-based market simulation.

**MGT 258. Logistics and Supply Chain Management (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MGT 207 or consent of instructor. Studies the integration of value-creating elements in supply, procurement, manufacturing, distribution, and logistics processes, using information technologies as a main enabler. Topics include distribution networks, demand management, sourcing, transportation, pricing, supply chain coordination, information technology, and e-business.

**MGT 259. Operations Planning and Control (4)** Seminar, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 207. A study of the design of systems used for controlling assets, planning, and scheduling in manufacturing and service operations. Includes analysis of operating systems and discussion of planning and scheduling methods, heuristics, and interfaces with MRP and JIT inventory systems. Emphasizes the importance of integration, flexibility, and automation of the operation system.

**MGT 260. Contemporary Issues in Management (4)** Seminar, 30 hours per quarter; individual study, 30 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Focuses on recent developments and selected topics in contemporary management practices. Discusses innovative practices in areas such as marketing, finance, accounting, information technology, production, and distribution. Includes presentations by students, invited scholars and business professionals. Course is repeatable as topics change to a maximum of 8 units.

**MGT 261. Contemporary Issues in Entrepreneurship (4)** Seminar, 30 hours per quarter; individual study, 30 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Addresses current issues and innovations in entrepreneurial management to develop a broad understanding of the interrelationship among all functions of management, including marketing, finance, accounting, information technology, production, and distribution. Discusses topics such as family business management, entrepreneurial marketing, managing growth, strategies for innovation, and market entry and exit decision making.

**MGT 262. Advanced Topics in Management (4)** Seminar, 30 hours per quarter; outside research, 30 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Intensive study of selected topics in management. Includes readings, discussion, and presentation of research. Requires completion of an analytical research paper based on recent advances in management strategy. Topics include leadership, change, value creation, and innovations in strategies related to the functional areas of management. Course is repeatable as topics change to a maximum of 8 units.

**MGT 263. Advanced Topics in Entrepreneurship (4)** Seminar, 30 hours per quarter; outside research, 30 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Explores various topics relevant to the development of entrepreneurial skills in a variety of management functions, including marketing, finance, and operations. Includes lectures, case studies, presentations by entrepreneurs, and exercises to provide students with a realistic understanding of entrepreneurial challenges.

**MGT 264. Information Systems Resources Management (4)** Seminar, 3 hours; outside research, 2 hours; extra reading, 1 hour. Prerequisite(s): MGT 205 or consent of instructor. Provides an understanding of the issues, strategies, and tactics involved in managing information systems in large organizations. Topics include cost allocation, capacity planning, congestion problems, and distributed information systems. Relies heavily on case studies.

**MGT 265. Decision Support and Expert Systems (4)** Seminar, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 205, MGT 207; or consent of instructor. Covers advanced topics in management support systems, including problem theory, decision support, and expert systems. Examines key issues involved in using information systems for decision making. Explores how information systems are used to solve management problems.

**MGT 266. Project Management (4)** Seminar, 3 hours; extra reading and project, 3 hours. Prerequisite(s): MGT 207 or equivalent. Addresses issues of project planning and control. Topics include differences between projects and production systems; project selection; project teams; breakdown structures of organization and work; scheduling and budgeting; resources management; project control and evaluation; and current project management software.

**MGT 267. Applied Business Forecasting (4)** Seminar, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 201 or equivalent. Provides experience in developing forecasting models and applying them to problems in marketing, production, inventory management, business economics, and other fields. Discusses issues in data acquisition, data analysis, modeling of relations between variables, trend analysis, and seasonal forecasting. Uses case studies and applications from a variety of management areas.

**MGT 268. Entrepreneurial Finance and Venture Capital (4)** Seminar, 3 hours; extra reading, 1 hour; case studies, 2 hours. Prerequisite(s): MGT 202. Covers financing of nonpublic and early-stage venture. Includes financial modeling, cash needs assessment, valuation, deal structure, financing alternatives, and harvesting.

**MGT 269. The New Venture and the Business Plan (4)** Seminar, 3 hours; outside research, 2 hours; case study preparation, 1 hour. Prerequisite(s): MGT 246 or consent of instructor. Focuses on the entrepreneurial process from conception to birth of a new venture. Explores the process of developing an opportunity assessment, structuring and rewarding the founding management team, and marshalling necessary critical resources through the development of a full-scale business plan.

**MGT 270. Corporate Social Responsibility (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Addresses managerial and ethical issues in the social, political, and legal environments of business. Focuses on strategies that firms employ to enhance performance, given their multiple stakeholders (e.g., consumers, suppliers, government, local communities, activists, nongovernmental organizations). Uses domestic and international cases to illustrate the strategic use of corporate social responsibility.

**MGT 272. Global Strategy and Management (4)** Seminar, 3 hours; outside projects, 3 hours. Prerequisite(s): MGT 200, MGT 202, MGT 209; or consent of instructor. Provides an overview of the strategic issues that multinational firms and managers encounter in a global marketplace. Topics include the globalization of the world economy, mode of entry into markets, analysis of political risk, global strategic alliances, and competing in emerging economies.

**MGT 274. Special Topics in Finance (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 202. Explores the latest developments in theoretical and empirical finance. Topics include asset pricing, performance evaluation, derivative securities, market microstructure, corporate finance, and corporate control and governance.

**MGT 276. Financial Strategy and Corporate Control (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 202. Covers the nexus among finance, strategy, governance, and corporate control. Examines the theory and empirical evidence for models of corporate financial policy and the market for corporate control. Emphasizes critical evaluation of the evidence for different models of corporate financial policy.

**MGT 277. Advanced Financial Accounting (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): BUS 165C or equivalent (may be taken concurrently). Covers advanced financial accounting and reporting practices. Emphasizes topics such as consolidated financial statements, branch accounting, foreign transactions, segment reporting, partnership accounting, and accounting for nonprofit organizations.

**MGT 278A. Foundations of Auditing and Assurance Services (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): BUS 165B or equivalent or consent of instructor. Examines the history, demand, and foundations of audit and assurance. Focuses on judgment and fundamentals of evidential reasoning. Topics include risk assessment, internal control, audit evidence, independence and objectivity, measurement theory, suitable criteria, standards and regulation, framing, heuristics and biases, and the role of technology.

**MGT 278B. Information Technology Auditing and Assurance (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 278A or consent of instructor. Covers basic concepts and techniques used in the provision of information technology audit and assurance services. Topics include information technology security; risk assessment; internal control; nature of audit evidence; independence and objectivity; suitable criteria; the role of standards and technology; and ethical issues.

**MGT 278C. Internal Auditing (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 278A or consent of instructor. Examines the nature and practices of internal (operational) audit and assurance, the management audit process, and the use of internal auditing by top management and governing boards. Develops skills to understand, analyze, and critically evaluate internal audit research.

**MGT 280. Business Issues in Electronic Commerce (4)** Seminar, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 205 or consent of instructor. Provides an understanding of the various business strategies, management issues, and pertinent technologies related to electronic commerce. Explores several of the problems surrounding electronic commerce including security issues, privacy, encryption, safeguarding of intellectual property rights, acceptable use policies, and legal issues.

**MGT 281. Systems Analysis and Design (4)** Seminar, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 205, MGT 230; or consent of instructor. Provides an understanding of the systems development life cycle with emphasis on the analysis and design phases. Familiarizes students with the tools and processes used by system developers to analyze, design, and construct computer-based systems. Provides experience in analyzing and designing a computer-based system.

**MGT 282. Business Data Communications (4)** Seminar, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 205. Provides insight into the role of telecommunications in business, with an emphasis on information management. Specific topics include data communications (hardware components, interfaces, and link protocols), architecture and technology (protocols, local area networks, and emerging digital services), and network management (control and security).

**MGT 288A. Behavioral Research in Marketing (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Examination of the development of consumer behavior research and evaluation from theoretical as well as practical perspectives. Provides insight into the integrative framework for organizing knowledge of consumer behavior and conducting research.

**MGT 288B. Quantitative Research in Marketing (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Introduces the fundamentals of modeling in marketing. Studies research issues associated with marketing management decisions. Emphasizes empirical research. Examines of strategic marketing, marketing segmentation, new product development and introduction, pricing strategies, channel policy, promotional decisions, and sales force management.

**MGT 288C. Special Topics in Marketing- Behavioral (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. An in-depth examination selected topics in consumer behavior. Utilizes journal articles to facilitate exploration of these topics.

**MGT 288D. Special Topics in Marketing - Quantitative (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. A study of the modeling of consumers and markets. Topics include conjoint analysis, logit choices models, market structure analysis, consideration sets, variety seeking, and models of purchase timing and purchase quantity. Utilizes journal articles to facilitate exploration of these topics.

**MGT 289A. Micro Organizational Theory (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. A study of the intersection of individual and group behavior within organizations. Introduces the behavioral science literature relevant to the study of behavior in organizational. Topics include emotions in organizations, motivation, leadership, decision making, interpersonal relations, diversity and identity, culture, and organizational learning and routines.

**MGT 289B. Macro Organizational Theory (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. A study of theories related to structure of organizations and control systems both within and external to the organization. Emphasizes the interaction of organizations with their environments. Incorporates theoretical and empirical contributions from institutional analysis, resource dependence, population ecology, and transaction costs.

**MGT 289C. Strategic Management (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Focuses on the conduct and performance of organizations. Topics in strategy research explain differences in organizations' profitability and survival by relating variance in these performance outcomes to factors at multiple levels. Provides theoretical perspectives from economics, sociology, and psychology to supplement approaches to understanding firm performance and related issues.

**MGT 289D. Designing Organizational Research (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Provides a survey of the design approaches for non-laboratory study within and across organizations. Covers research strategies appropriate to the study of different organizational questions. Topics include issues of measurement, types of data, and data collection methods (including archival, surveys, interviews, and social network data).

**MGT 290. Directed Studies (1-6)** Prerequisite(s): consent of instructor. Directed studies and research in selected problems or theories of management for advanced graduate students to pursue special areas of interest. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MGT 295 (E-Z). Seminars in Finance (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): doctoral standing in Management or consent of instructor. Topics include discrete and continuous time asset pricing theory and portfolio choice; empirical research in finance (including recent developments in empirical asset pricing); and advanced topics in corporate finance theory and related empirical research.

**MGT 295F. Empirical Methods in Finance (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 205A or equivalent or consent of instructor; doctoral standing in Management or consent of instructor. Covers econometric approaches to analyzing common problems encountered when conducting empirical research. Focuses on hypothesis testing, specification tests, general methods of moments estimation, the capital asset pricing model, multifactor asset pricing models, event studies, operating performance studies, simultaneous equations models, and endogeneity issues. Demonstrates programming in SAS and/or Gauss.

**MGT 295G. Corporate Finance (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): doctoral standing in Management or consent of instructor. Deals with the contemporary issues in corporate finance. Focuses on selected classic and current empirical and theoretical research in corporate finance. Seeks to provide an advanced and rigorous background in the mainstream issues of modern corporate finance with an emphasis on empirical methodology.

**MGT 297. Directed Research (1-6)** Prerequisite(s): consent of instructor. Directed research in selected problems of management for graduate students with special research interests. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MGT 298-I. Fieldwork in Management (1-4)** Field, 3-12 hours; consultation, 1 hour. Prerequisite(s): consent of instructor. Supervised field experience culminating in a final report or other academic component. May be repeated for up to 8 units of credit toward the degree.

**MGT 299. Research for Thesis or Dissertation (1-12)** Prerequisite(s): consent of instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**MGT 302. Apprentice Teaching (1-4)** Seminar, 1-4 hours. Prerequisite(s): limited to departmental teaching assistants; graduate standing. Supervised individual instruction in teaching including monitoring of teaching assistant's activities and regular consultation with assistant concerning teaching responsibilities. Graded Satisfactory (S) or No Credit (NC). May be repeated; not for degree credit.

**MGT 403. Review of Quantitative Methods for Management (4)** Lecture, 3 hours; laboratory, 1 hour; individual study, 2 hours. Prerequisite(s): graduate standing. Reviews quantitative concepts and techniques related to the various functional areas of management. Topics include properties of functions, systems of equations and matrices (linear algebra), differentiation and integration (calculus), and basic probability concepts. Not for degree credit. Satisfactory (S) or No Credit (NC) grading is not available.

**MGT 404. Communications, Leadership, Teams, and Ethics (2)** Lecture, 7 hours per quarter; workshop, 28 hours per quarter. Prerequisite(s): graduate standing. Uses case discussions, presentations, and theoretically informed readings to develop communication, presentation, and leadership skills; examine the principles of effective teamwork; and introduce representative ethical issues confronting managers. Not for degree credit.

## Marxist Studies Minor

### College of Humanities, Arts, and Social Sciences

Joseph Childers, Ph.D., Chair  
Thomas Patterson, Ph.D., Acting Chair  
HMSS 2109  
(951) 827-1829;  
[www.marxiststudies.ucr.edu](http://www.marxiststudies.ucr.edu)

#### Committee in Charge

Edna Bonadich, Ph.D. (Sociology/Ethnic Studies, Emeritus)  
Christopher Chase-Dunn, Ph.D. (Sociology)  
Jennifer Doyle, Ph.D. (English)  
Carole Fabricant, Ph.D. (English, Emeritus)  
Christine Gailey, Ph.D. (Women's Studies)  
Victor Lippit, Ph.D. (Economics)  
Brian Lloyd, Ph.D. (History)  
Bernd Magnus, Ph.D. (Philosophy, Emeritus)  
B. Toby Miller, Ph.D. (Media and Cultural Studies)  
Ken Rogers, Ph.D. (Media and Cultural Studies)  
Georgia Warnke, Ph.D. (Political Science)  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

The Marxist Studies minor integrates courses from various disciplines in order to examine the theory and main applications of Marxism in the social sciences and humanities disciplines.

Requirements for the minor (24 units)

- Theory, method, and history of thought requirement
  - ECON 115
  - PHIL 153
- Four courses from the following dealing with applications of Marxist studies in various fields:
  - ANTH 131
  - CPLT 180X
  - ECON 175
  - POSC 160
  - WRLT 170/ETST 170

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and

Programs section of this catalog for additional information on minors.

## Materials Science and Engineering

**Subject abbreviation: MSE**  
**The Marlan and Rosemary Bourns**  
**College of Engineering**

Alexander A. Balandin, Ph.D., Chair  
Advising Office, A159C Bourns Hall;  
(951) 827-3647 (ENGR)  
[cmsmse.engr.ucr.edu](http://cmsmse.engr.ucr.edu)

#### Program Committee

Alexander A. Balandin, Ph.D., (Electrical Engineering)  
Mart Molle, Ph.D. (Computer Science and Engineering)  
Nosang Myung, Ph.D. (Chemical and Environmental Engineering)  
Cengiz Ozkan, Ph.D. (Mechanical Engineering)  
Valentine Vullev, Ph.D. (Bioengineering)

#### Adjunct Associate Professor

Kassimir Bozhilov, Ph.D.

### Major

The B.S. degree in Materials Science and Engineering is offered jointly by the five participating departments of The Marlan and Rosemary Bourns College of Engineering. The program aims to produce students who are effective team players in materials engineering or related engineering, science or managerial positions, who use and improve on their skills in the job; who can enter into graduate or professional degree programs; and who are responsible engineers, professionals or scientists demonstrating ethical and professional responsibility and continuing to learn through a variety of educational experiences.

The program aims to produce graduates who:

- can apply knowledge of the scientific and engineering principles underlying major elements of materials engineering -- the structure, properties, processing, and performance of materials
- can design and conduct experiments relevant to materials science and engineering as well as analyze and interpret experimental data
- can identify, formulate, and solve materials selection and design problems
- can work in multidisciplinary teams
- can appreciate professional and ethical responsibility and the importance of continued learning after graduation
- can communicate effectively
- have a basic understanding of the impact of engineering on society, including the economy and environment
- have an elementary understanding of contemporary issues in materials science and engineering

### University Requirements

See Undergraduate Studies section.

### College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Materials Science and Engineering major uses the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

- One course in the biological sciences chosen from an approved list
- CHEM 001A, CHEM 001LA
- MATH 008B or MATH 009A
- PHYS 040A, PHYS 040B

### Major Requirements

- Lower-division requirements (68 units)
  - CHEM 001A, CHEM 011A, CHEM 001B, CHEM 011B, CHEM 001C, CHEM 011C
  - CS 030
  - EE 001A, EE 011A
  - MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
  - ME 010
  - MSE 001
  - PHYS 040A, PHYS 040B, PHYS 040C
- Upper-division requirements (53 units)
  - CHEM 112A
  - CEE 135
  - CHE 100
  - EE 138
  - ENGR 180W
  - ME 110, ME 114, ME 156
  - MSE 160, MSE 161, MSE 175A, MSE 175B
  - STAT 155
  - Technical Electives (20 units): chosen from BIEN 140A/CEE 140A, BIEN 140B/CEE 140B, CEE 147, EE 133, EE 136, EE 137, EE 139, ME 113, ME 116, ME 138, ME 153, ME 180

Visit the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu) for a sample program.

### Graduate Program

The M.S./Ph.D. in Materials Science was recently approved. For specific program requirements, please contact the program.

### Lower-Division Course

**MSE 001. Fundamentals of Materials Science and Engineering (2)** Lecture, 1 hour; discussion, 1 hour; laboratory, 1 hour. An introduction of properties and applications of different types of materials essential for various areas of engineering. Explores the relationship between structure and properties as well as process-

ing of the materials. Illustrates a wide range of properties required for different types of applications. Graded Satisfactory (S) or No Credit (NC).

## Upper-Division Courses

### MSE 160. Nanostructure Characterization

**Laboratory (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 114. Covers structure of materials at the nanoscale, including semiconductors, ceramics, metals, and carbon nanotubes. Explores relationships among morphology, properties, and processing. Addresses primary methods of characterization, including scanning electron microscopy, scanning probe microscopy, X-ray diffraction, and transmission electron microscopy. Also covers elementary discussions of X-ray, vibrational, and electron waves in solids and introductory diffraction theory.

### MSE 161. Analytical Materials Characterization (4)

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MSE 160. Analysis of the surfaces of materials via ion, electron, and photon spectroscopies. Includes Rutherford back scattering; secondary ion mass spectroscopy; electron energy loss spectroscopy; Auger electron spectroscopy; X-ray photoelectron spectroscopy; photoluminescence; extended X-ray absorption fine structure; Fourier transform infrared spectroscopy; and Raman spectroscopy. Also covers sputtering, high-vacuum generation, and focused ion beam milling.

**MSE 175A. Senior Design (4)** Lecture, 2 hours; discussion, 1 hour; practicum, 3 hours. Prerequisite(s): CHE 116 or ME 116A; EE 139; senior standing in Materials Science and Engineering. Covers preparation of formal engineering reports and statistical analysis on a series of problems illustrating methodology from various branches of applied materials science and engineering. Addresses the entire design process: design problem definition; generation of a design specification; documentation; design review process; prototype fabrication; testing and calibration; cost estimation; and federal guidelines. Requires a term project and oral presentation. Graded In-Progress (IP) until MSE 175A and MSE 175B are completed, at which time a final, letter grades is assigned.

**MSE 175B. Senior Design (4)** Lecture, 1 hour; discussion, 1 hour; practicum, 6 hours. Prerequisite(s): MSE 175A; senior standing in Materials Science and Engineering. Covers preparation of formal engineering reports and statistical analysis on a series of problems illustrating methodology from various branches of applied materials science and engineering. Addresses the entire design process: design problem definition; generation of a design specification; documentation; design review process; prototype fabrication; testing and calibration; cost estimation; and federal guidelines. Requires a term project and oral presentation. Satisfactory (S) or No Credit (NC) grading is not available.

## Graduate Courses

### MSE 200. Graduate Studies in Materials Science and Engineering (2)

Lecture, 2 hours. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Introduction to graduate studies in Materials Science and Engineering. Covers the fundamental methods of the discipline. Provides an overview of the areas of specialization, as well as research opportunities and facilities. Summarizes employment opportunities for graduates from the Materials Science and Engineering program. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or exam-

ination. Course is repeatable as content changes to a maximum of 4 units.

### MSE 201. Thermodynamic Foundations of Materials (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Covers the laws of thermodynamics and fundamental equations for multi-component elastic solids, electromagnetic media, and equilibrium criteria. Describes applications to solution thermodynamics, point defects in solids, elastic effects, phase diagrams, transitions, and interfaces. Includes nucleation theory, kinetics (diffusion of heat, mass, and charge), and coupled flows.

### MSE 204. Thermodynamics and Statistical Mechanics (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Covers thermodynamics, statistical mechanics, ideal Bose systems, ideal Fermi systems, and bulk motion. Cross-listed with PHYS 212A.

### MSE 205. Advanced Physical Chemistry: Thermodynamics (3)

Lecture, 3 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C" or better. Covers concepts in thermodynamics including fundamental equations, potentials, Maxwell relations, and stability criteria. Cross-listed with CHEM 201D.

### MSE 207. Applied Quantum Mechanics (4)

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 046, PHYS 040A; or consent of instructor. Covers topics in quantum mechanics including Schrodinger equation; operator formalism; harmonic oscillator; quantum wells; spin, bosons, and fermions; solids; perturbation theory; Wentzel-Kramers-Brillouin approximation; tunneling; tight-binding model; quantum measurements; quantum cryptography; and quantum computing. Cross-listed with EE 201.

### MSE 208. Mechanics and Physics of Materials (4)

Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the structure and properties of materials; the characterization and modeling of mechanical, thermal, electric, and magnetic properties of materials; and coupling properties. Topics include phase transformations and brittle-to-ductile transitions. Cross-listed with ME 266.

### MSE 210. Crystal Structure and Bonding (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Covers regular and irregular arrays of points and spheres. Includes lattices (direct and reciprocal); crystallographic point and space groups; and atomic structures. Also addresses bonding in molecules and solids; ionic Pauling rules; and covalent and metallic bonding. Surveys the structure of elements, compounds, minerals, and polymers.

### MSE 214. Condensed Matter Physics (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221C; graduate standing or consent of instructor. Topics include classical and quantum theories of the electron gas; crystal and reciprocal lattices; X-ray diffraction; crystal symmetries; electrons in a periodic potential; nearly free electrons; tight binding; semiclassical dynamics; and semiclassical transport. Students whose research is related to condensed matter physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. Cross-listed with PHYS 240A.

### MSE 217. Fundamentals of Semiconductors and Nanostructures (4)

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 133, EE 201/MSE 207; or consent of instructor. Examines principles of semiconductor materials and nanostructures. Topics include periodic structures, electron and phonon transport, defects, optical properties, and radiative recombination. Also covers absorption and emission of radiation

in nanostructures and nonlinear optics effects. Emphasizes properties of semiconductor superlattices, quantum wells, wires, and dots. Cross-listed with EE 202.

### MSE 218. Imperfections in Solids (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or Computer Science or Electrical Engineering or Materials Science and Engineering or Mechanical Engineering. Covers fundamentals of crystal structures and crystal defects, including the generation of point defects; nucleation and propagation of dislocations; perfect and partial dislocations; twins, stacking faults, and transformations; mechanics of semiconductor and metallic thin films and multilayered structures. Cross-listed with ME 278.

### MSE 220. Materials Characterization Techniques (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Covers basic principles of techniques used in the characterization of engineering materials by electron microscopy, diffraction, and spectroscopy. Provides analysis of defects responsible for materials properties. Addresses modern electrical, optical, and particle beam techniques for material characterization. Includes Hall Effect and Raman spectroscopy.

### MSE 221. Electron Microscopy and Microanalysis (3)

Lecture, 3 hours. Prerequisite(s): graduate standing in Materials Science & Engineering or consent of instructor. Introduces electron microscopy and microanalysis of inorganic solids including synthetic nanomaterials and minerals. Provides the underlying physical principles of electron microscopy and microanalysis; the strengths and limitations of the method; and the potential applications in characterization of morphology, structure, composition, and defects of inorganic materials and nanostructures. Optional, related laboratory courses are available: MSE 222L, MSE 223L.

### MSE 222L. Laboratory in Transmission Electron Microscopy (1)

Laboratory, 2 hours; written work, 1 hour. Prerequisite(s): Concurrent or previous enrollment in MSE 221 or consent of instructor. Provides practical training in transmission electron microscopy and associated techniques including sample preparation.

### MSE 223L. Laboratory in Scanning Electron Microscopy (1)

Laboratory, 2 hours; written work, 1 hour. Prerequisite(s): Concurrent or previous enrollment in MSE 221 or consent of instructor. Provides practical training in scanning electron microscopy and associated techniques including sample preparation.

### MSE 225A. Physical Organic Chemistry: Organic Structure Analysis (3)

Lecture, 3 hours. Prerequisite(s): CHEM 211A, CHEM 211B, CHEM 211C. Utilizes modern spectroscopic techniques such as IR, mass spectrometry, and <sup>1</sup>H and <sup>13</sup>C NMR to determine the structure of complex organic molecules. Topics include advanced NMR techniques such as 2D NMR, NMR pulse sequences, diffusion NMR, and MRI. Cross-listed with CHEM 216A.

### MSE 225B. Advanced Analytical Chemistry: Optical Spectroscopy (3)

Lecture, 3 hours. Prerequisite(s): CHEM 125. Provides an overview of modern analytical optical spectroscopic techniques including theory, instrumentation, and applications. Cross-listed with CHEM 221B.

### MSE 225C. Introduction to Computational Quantum Chemistry (3)

Lecture, 3 hours. Prerequisite(s): CHEM 113 or equivalent, graduate standing; or consent of instructor. Introduces computational techniques in quantum chemistry. Includes Hartree-Fock theory, Density Functional Theory, and electron correlation

methods. Emphasizes practical applications in a research setting. Cross-listed with CHEM 206A.

**MSE 226. Optical Methods in Biology, Chemistry, and Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 109 or equivalent; graduate standing; consent of instructor. Covers the origin of fluorescence and other emission processes that modulate the characteristics of molecular emissions. Presents emission-based analytical and bioanalytical methods and techniques. Reviews state-of-the-art instrumentation, including their applicability, limitations, and source. Also provides interpretation and meaning of the measured signals as applied to biological systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes. Cross-listed with BIEN 245.

**MSE 227. Nanoscale Characterization Techniques (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 201/MSE 207, EE 202/MSE 217, EE 203/MSE 237C; or consent of instructor. An in-depth study of nanoscale materials and device characterization techniques. Laboratory emphasizes atomic force microscopy (AFM) and scanning tunneling microscopy (STM). Topics include semiconductor fabrication fundamentals; metrology requirements; in situ monitoring; interconnects and failure analysis; principles of AFM, STM, and scanning electron microscopy; X-ray methods; optical and infrared techniques; and electrical characterization. Cross-listed with EE 206.

**MSE 230. Functional Materials: Semiconductors (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Covers semiconductor crystal growth techniques; purification; doping; radiation damage; annealing; metal-semiconductor interfaces; defects and impurities; and major electronic and optical methods for the analysis of semiconductors. Includes semiconductor device fabrication issues.

**MSE 234A. Physics of Nanoscale Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores the fundamental concepts and techniques of nanoscale physics, including nanoscale fabrication and characterization techniques, electronic properties in reduced dimensions, properties of carbon nanotubes, nanoelectromechanical systems, superconductivity in reduced dimensions, and nanophotonics. Students whose research is related to materials and nanoscale systems physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. Cross-listed with PHYS 234.

**MSE 234B. Spintronics and Nanoscale Magnetism (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of contemporary issues in nanoscale magnetism and spin-dependent phenomena in solids, including the fundamentals of magnetism, magnetism in reduced dimensions, novel magnetic materials, spin-polarized transport, spin coherence in semiconductors, magnetization dynamics, and device applications. Students whose research is related to materials and nanoscale systems physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. Cross-listed with PHYS 235.

**MSE 237A. Applied Ferromagnetism (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 116; consent of instructor. Introduces fundamentals of ferromagnetism necessary to develop next-generation nanomagnetic and spintronics-related devices. Includes basics of magnetism, magnetic circuits, ferromagnetic resonance (FMR), nuclear magnetic reso-

nance (NMR), spintronics, and analyses of applications. Cross-listed with EE 220.

**MSE 237B. Nanoscale Phonon Engineering (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 202/MSE 217. Studies acoustic and optical phonons that affect electrical, thermal, and optical properties of materials. Focuses on the confinement-induced changes of phonon properties in nanostructures and their implications for performance of electronic, thermoelectric, and optoelectronic devices. Explores phonon theory, Raman spectroscopy and other phonon characterization techniques, thermal conductivity, and related measurements. Cross-listed with EE 216.

**MSE 237C. Solid-State Devices (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): EE 133 or consent of instructor. Covers electronic devices including p-n junctions, field-effect transistors, heterojunction bipolar transistors, and nanostructure devices. Explores electrical and optical properties of semiconductor heterostructures, superlattices, quantum wires, and dots, as well as devices based on these structures. Cross-listed with EE 203.

**MSE 238. Introduction to Microelectromechanical Systems (4)** Lecture, 4 hours. Prerequisite(s): ME 110, ME 114, or equivalents. An introduction to the design and fabrication of microelectromechanical systems (MEMS). Topics include micromachining processes; material properties; transduction; applications in mechanical, thermal, optical, radiation, and biological sensors and actuators; microfluidic devices; Bio-MEMS and applications; packaging and reliability concepts; and metrology techniques for MEMS. Cross-listed with ME 270.

**MSE 240. Materials Synthesis and Processing (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers synthesis of functional materials and materials processing. Functional materials include semiconductors, metals, polymers, and nanoscale-materials such as nanotubes and nanoparticles. Focuses on methods of semiconductor fabrication and their physical and chemical foundation.

**MSE 245A. Advanced Organic Reactions (3)** Lecture, 3 hours. Prerequisite(s): CHEM 112C. Covers modern organic reactions and reagents and their mechanistic pathways. Emphasizes recent developments. Cross-listed with CHEM 210.

**MSE 245B. Structure and Bonding in Inorganic Chemistry (3)** Lecture, 3 hours. Prerequisite(s): CHEM 150A, CHEM 150B. Covers advanced synthesis, structure, and bonding in inorganic, coordination, and organometallic chemistry. Cross-listed with CHEM 231A.

**MSE 245C. Nanoscience and Nanotechnology (3)** Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. Provides a condensed, interdisciplinary overview of selected fields of nanoscience and emerging nanotechnological applications. Focuses on applications relevant for the campus research community that are not based on electronic applications of silicon. Cross-listed with CHEM 203.

**MSE 245D. Interdisciplinary Overview of Current Issues in Semiconductor Processing (3)** Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. An interdisciplinary overview of present-day semiconductor processing. Introduces topics such as properties of semiconductors, cleanroom environment, epitaxy, ion implantation, etching, lithography, device architecture, testing, and fault detection.

May offer field trips. Cross-listed with CHEM 208 and PHYS 202.

**MSE 246. Cellular and Molecular Engineering (4)** Lecture, 2 hours; discussion, 1 hour; practicum, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Emphasizes biophysical and engineering concepts intrinsic to specific topics at the cellular and molecular level. Includes receptor-ligand dynamics in cell signaling and function; DNA replication and RNA processing; cellular and protein sorting; control of gene expression; membrane structure, transport and traffic; biological signal transduction; and mechanics of cell division. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BIEN 224.

**MSE 248. Nanoscale Science and Engineering (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An overview of the machinery and science of the nanometer scale. Topics include patterning of materials via scanning probe lithography; electron beam lithography; nanoimprinting; self-assembly; mechanical, electrical, magnetic, and chemical properties of nanoparticles, nanotubes, nanowires, and biomolecules (DNA, protein); self-assembled monolayers; and nanocomposites and synthetic macromolecules. Cross-listed with ME 272.

**MSE 250. Colloquium in Materials Science and Engineering (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Presentations on current topics in Materials Science and Engineering presented by invited speakers, UCR faculty, and graduate students. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**MSE 251. Topics in Materials Science and Engineering (1)** Seminar, 1 hour. Prerequisite(s): graduate standing in Materials Science & Engineering or consent of instructor. Presentations on current topics in Materials Science and Engineering by special speakers, UCR faculty, and graduate students. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 21 units.

**MSE 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor. Individual study directed by a faculty member on selected topics in Materials Science and Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**MSE 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor. Research conducted under the supervision of a faculty member on selected topics in Materials Science and Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MSE 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): consent of instructor; graduate standing. Research in materials science and engineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MSE 302. Teaching Practicum (1-2)** Consultation, 1-2 hours. Prerequisite(s): appointment as a teaching assistant in Materials Science and Engineering; consent of instructor and graduate advisor. Topics include effective teaching methods, such as those involved in leading discussion sections and preparing

and grading examinations, as well as student-instructor relations in lower- and upper-division Materials Science and Engineering courses. Required each quarter of teaching assistants and associates in Materials Science and Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**MSE 302. Teaching Practicum (1-2)** Consultation, 1-2 hours. Prerequisite(s): appointment as a teaching assistant in Materials Science and Engineering; consent of instructor and graduate advisor. Topics include effective teaching methods, such as those involved in leading discussion sections and preparing and grading examinations, as well as student-instructor relations in lower- and upper-division Materials Science and Engineering courses. Required each quarter of teaching assistants and associates in Materials Science and Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Mathematics

**Subject abbreviation: MATH**  
**College of Natural and Agricultural Sciences**

Vyjayanthi Chari, Ph.D., Chair  
Department Office, 202 Surge Building  
(951) 827-3113; [www.math.ucr.edu](http://www.math.ucr.edu)

### Professors

John C. Baez, Ph.D.  
Mei-Chu Chang, Ph.D.  
Vyjayanthi Chari, Ph.D.  
Gerhard Gierz, Ph.D.  
Michel L. Lapidus, Ph.D.  
Yat Sun Poon, Ph.D.  
Ziv Ran, Ph.D.  
David E. Rush, Ph.D.  
Reinhard Schultz, Ph.D.  
Stefano Vidussi, Ph.D.  
Bun Wong, Ph.D.  
Feng Xu, Ph.D.  
Qi S. Zhang, Ph.D.

### Professors Emeriti

Theodore J. Barth, Ph.D.  
Richard E. Block, Ph.D.  
Bruce L. Chalmers, Ph.D.  
John E. de Pillis, Ph.D.  
Neil E. Gretsky, Ph.D.  
Lawrence H. Harper, Ph.D.  
Frederic T. Metcalf, Ph.D.  
J. Keith Oddson, Ph.D.  
Malempati M. Rao, Ph.D.  
Louis J. Ratliff, Jr., Ph.D.  
Victor L. Shapiro, Ph.D.  
James D. Stafney, Ph.D.  
Albert R. Stralka, Ph.D.

### Assistant Professors

Wee Liang Gan, Ph.D.  
Jacob Greenstein, Ph.D.  
Zhang-Dan Guan, Ph.D.  
Frederick H. Wilhelm, Jr., Ph.D.

### Assistant Professors

Marta Asaeda, Ph.D.  
Julia Bergner, Ph.D.  
Kevin Costello, Ph.D.  
Juhi Jang, Ph.D.  
James Kelliher, Ph.D.  
Thomas Laurent, Ph.D.

\*\*

### Visiting Assistant Professors

Irfan Bagci, Ph.D.  
Jiarui Fei, Ph.D.  
Karl Fredrickson, Ph.D.  
Gung Min Gie, Ph.D.  
Philip Hackney, Ph.D.  
Ines Henriques, Ph.D.  
Mihaela Ignatova, Ph.D.  
Lina Lee, Ph.D.  
Kuei-Nuan Lin, Ph.D.  
Jason McCullough, Ph.D.  
Stephen Muir, Ph.D.  
Pedro Solorzano, Ph.D.  
A.J. Todd, Ph.D.  
Michael Williams, Ph.D.  
Mang Wu, Ph.D.

### Lecturers

Jairo Aguilar  
Lisa Bruce  
Stephen Carr  
Michael Curtis  
Sandra Fay  
Yuichiro Kakihara, Ph.D.  
Rob Lam  
Jose Villa

### Cooperating Faculty

Bai-Lian "Larry" Li, Ph.D. (Botany and Plant Sciences)

## Major

The Department of Mathematics offers a B.A. and B.S. degree in programs that share a common, solid mathematical foundation but differ in their specializations in the pure and applied areas of mathematics. These programs can provide the basis for careers in mathematics itself or within the many scientific and business fields, which, in today's technological society, depend on a basic knowledge of mathematical methods.

The **B.A. in Mathematics**, following the liberal arts tradition, combines a broad coverage of the humanities and social sciences with a moderate amount of advanced mathematics in the major. It is selected most often either by students who intend to obtain a teaching credential with a specialty in mathematics or by students who wish to pursue graduate work in business or the social sciences.

The **B.S. in Mathematics** is more technical and contains a greater concentration of work in the major field. The Pure Mathematics program is directed toward students who may wish to pursue graduate work in mathematics. The Applied Mathematics programs, with options in Biology, Chemistry, Economics, Environmental Sciences, Physics, and Statistics, are designed to provide a rigorous training in mathematics together with a substantial background in the discipline of the option. The Computational Mathematics program is designed to prepare the student for professional work with computers and computer systems and for graduate work in computer science.

The **B.S. in Mathematics for Secondary Teachers** is intended for students planning to pursue a career in secondary education. Its courses cover the high school curriculum from an advanced perspective. Students are required to complete mathematics education and education courses in order to facilitate

presence in the classroom early in their undergraduate career and to better prepare them for entry in a credential program.

## Academic Advising

Each Mathematics major is assigned a faculty advisor who assists the student in formulating educational goals and monitors the student's subsequent progress in an academic program. Each quarter a study list must be approved by this advisor. Advising for all math majors is conducted by the CNAS Academic Advising Center in 1223 Pierce Hall.

## Teaching Credential

Teachers in the public schools in California must have a credential approved by the State Commission on Teacher Credentialing. The credential requires an undergraduate major, baccalaureate degree, and completion of a graduate credential program such as that offered by the Graduate School of Education at UCR (see Education in this catalog). The Bachelor of Science in Mathematics for Secondary Teachers assists students in their preparation to face the challenges of a credentialing program.

Before admission and student teaching in a graduate credential program, the candidate must pass the California Basic Education Skills Test (CBEST) and demonstrate subject-matter proficiency in the fields which the candidate will teach. The candidate can demonstrate proficiency either by passing the commission's subject-matter assessment examination or completing an undergraduate program that is state approved for teacher preparation.

**California Teach-Science/Mathematics Initiative (CaTEACH-SMI)** California Teach-Science Mathematics Initiative (CaTEACH-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CaTEACH-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the SMI & Alpha Center Apprentice Programs, to explore STEM teaching as a career option. Through CaTEACH-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CaTEACH-SMI Resource Center provides future STEM teachers with material and financial resources which includes the National Science Foundation (NSF) Noyce Scholarship Program, to promote planning and professional development towards a science/mathematics education career.

For more information about the CaTEACH-SMI program, please visit <http://smi.ucr.edu> or at the Resource Center at 1315 Pierce Hall.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

## Major Requirements for the Bachelor of Arts and Bachelor of Science in Mathematics

To fulfill the Natural Sciences requirement, the Department of Mathematics requires the following:

- One of the year sequences
  - BIOL 002, BIOL 003, BIOL 005C
  - CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC,
  - PHYS 002A, PHYS 002B, PHYS 002C or PHYS 040A, PHYS 040B, PHYS 040C
- Either one course in the physical sciences listed above if (a) above is completed or one course in the biological sciences if (b) or (c) above is completed

The major requirements for the B.A. and B.S. degrees in Mathematics are as follows:

### For the Bachelor of Arts

- Lower-division requirements: MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
- Four (4) units of either CS 010 or one upper-division course in Statistics
- A minimum of 36 units of upper-division mathematics, excluding courses in the MATH 190–199 series

### For the Bachelor of Science

Lower-division requirements for all programs are MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046, CS 010 (CS 012 is recommended).

- Pure Mathematics program** (56 units)
  - Thirty-six (36) units of upper-division mathematics to include at least 24 units from MATH 131, MATH 132, MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C, MATH 171, MATH 172
  - At least three courses from (a) above must be from MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C
  - Courses in the MATH 190–199 series are excluded
  - Twenty (20) additional units of upper-division mathematics, upper-division computer science, or other related courses approved by the undergraduate advisor (For students who wish to pursue graduate work, courses in complex variables, differential equations, and probability may be particularly useful.)
- Applied Mathematics** programs
 

MATH 113 or MATH 131, MATH 132, MATH 146A, MATH 146B, MATH 146C and the

courses in one of the following options:

- Biology option
  - BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - MATH 149A
  - Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C
  - BIOL 102, BIOL 105, BIOL 108, BIOL 117
  - Four (4) additional units of upper-division biology
- Chemistry option
  - CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
  - Either PHYS 040A, PHYS 040B, PHYS 040C (preferred); or PHYS 002A, PHYS 002B, PHYS 002C
  - Four courses from MATH 120, MATH 135A, MATH 135B, MATH 149A, MATH 149B, MATH 149C, MATH 165A, MATH 165B
  - CHEM 110A, CHEM 110B, CHEM 111, CHEM 113
  - Four (4) additional units of upper-division chemistry
- Economics option
  - MATH 120, MATH 121, MATH 149A, MATH 149B, MATH 149C
  - Five upper-division economics courses (at least 20 units) to consist of ECON 102A and four courses to be chosen from ECON 102B, ECON 103A, ECON 103B, ECON 107, ECON 108, ECON 110, ECON 111, ECON 134/BUS 106, ECON 135, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 143C/ENSC 143C, ECON 156, ECON 206
- Environmental Sciences option
  - CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
  - ECON 006/ENSC 006
  - GEO 001 is recommended
  - MATH 149A
  - Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C, CS 177, STAT 155
  - ENSC 100/SWSC 100, ENSC 101, ENSC 102
  - Eight (8) additional units of upper-division environmental sciences
- Physics option
  - MATH 135A, MATH 165A, MATH 165B
  - Either MATH 120 or MATH 171
  - PHYS 130A, PHYS 130B

- Either PHYS 135A, PHYS 135B, PHYS 136 or PHYS 156A, PHYS 156B

- Statistics option
    - MATH 120, MATH 149A, MATH 149B, MATH 149C
    - Either STAT 130 or STAT 146
    - STAT 161, STAT 170A, STAT 170B, STAT 171
- Computational Mathematics** program
    - MATH 011/CS 011, MATH 113 or MATH 131, MATH 120, MATH 132, MATH 135A, MATH 135B
    - CS 012, CS 014, CS 141, CS 150
    - One additional CS course to be chosen from the list of approved technical elective courses.
    - Twenty-four (24) units of technical electives to be chosen from
      - MATH 111/CS 111, MATH 121, MATH 126, MATH 146A, MATH 146B, MATH 146C, MATH 149A, MATH 149B, MATH 149C, MATH 171
      - CS 130, CS 133, CS 166, CS 170, CS 177

## Major Requirements for the Bachelor of Science in Mathematics for Secondary School Teachers

- Lower-division Mathematics requirements (24 units)
 

MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
- Upper-division Mathematics requirements (36 units)
  - MATH 131, MATH 133, MATH 140, MATH 144, MATH 153
  - MATH 150A or MATH 151A
  - Three courses from: MATH 132, MATH 136, MATH 137, MATH 138A, MATH 145A, MATH 145B, MATH 149A, MATH 149B, MATH 149C, MATH 150B, MATH 151B, MATH 151C, MATH 171, MATH 172
- Additional Mathematics and related disciplines requirements (12 units)
  - CS 010
  - CS 011/MATH 011
  - STAT 155
- Natural Sciences (16–20 units)
  - BIOL 002 or BIOL 003 or BIOL 005A and BIOL 05LA
  - CHEM 001A and CHEM 01LA or CHEM 001HA and CHEM 1HLA
  - PHYS 002A or PHYS 040A
  - CHEM 001B and CHEM 01LB or CHEM 001HB and CHEM 1HLB or PHYS 002B or PHYS 040B or an additional laboratory Biological science course
- Social Sciences (16 units)
  - One course in ECON or POSC
  - One course in ANTH

- c. One course in PSYC
  - d. One course in SOC
6. Mathematics Education and Education requirements (18 or 19 units): EDUC 104/MATH 104, EDUC 003 or EDUC 004 or EDUC 100B or equivalent, EDUC 109, EDUC 110, EDUC 139
7. Recommended Courses  
LING 020 or LING 021, EDUC 116, EDUC 174, EDUC 177A

## Mathematics Honors Program

Candidates for the Honors Program in Mathematics must complete

1. Earn an overall GPA of at least 3.50 in Mathematics.
2. Earn a grade of “B” or better in each of MATH 151A, MATH 151B and MATH 151C.
3. Earn a grade of “B” or better in each of MATH 145B and MATH 171 OR in each of MATH 146A, MATH 146B and MATH 146C OR in each of MATH 149A, MATH 149B and MATH 149C.
4. Satisfactorily complete one of the following:
  - i) A research project earning a grade of “A” in MATH 197.
  - ii) Two courses chosen from one of the sequences: MATH 201A, 201B, 201C; MATH 205A, MATH 205B, MATH 205C; MATH 209A, MATH 209B, MATH 209C; MATH 210A, MATH 210B with a grade of “B” or better in each course.

It is the responsibility of the honors candidates to notify the department of their eligibility.

## Minor

The following are the requirements for a minor in Mathematics.

1. Lower-division courses (20 units): MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B
2. Upper-division requirements: 24 units of upper-division mathematics courses. Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements and no more than 4 units in courses numbered 190–199.

Students with a minor in Mathematics should consult with a faculty advisor in Mathematics to construct a specific program consistent with their goals.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For

further details visit UCR’s International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Programs

The Department of Mathematics offers the M.A., M.S., and Ph.D. degrees in Mathematics.

**Admission** Domestic applicants must supply GRE General Test scores (verbal, quantitative, and analytical).

### M.A. or M.S. in Mathematics

General university requirements are listed in the Graduate Studies section of this catalog. Specific requirements are as follows:

1. Passing written qualifying examinations at the master’s level (or higher) in two of the following fields: Advanced Ordinary Differential Equations, Partial Differential Equations, Advanced Statistical Inference, Calculus of Variations, Combinatorial Theory, Real Analysis, and Advanced Numerical Analysis
2. Thirty-six (36) units of approved courses, of which 18 must be in the 200 series (MATH 260 cannot be used without the Mathematics Graduate Committee’s approval.)
3. Completion of the courses MATH 131, MATH 132, MATH 151A, MATH 151B, MATH 146A, MATH 149A, or their equivalent. Also, MATH 165A is recommended, but not required

### M.S. in Mathematics (Applied)

General university requirements are listed in the Graduate Studies section of this catalog. Specific requirements are as follows:

1. Passing written qualifying examinations at the Master’s level (or higher) in two of the following fields: Advanced Ordinary Differential Equations, Partial Differential Equations, Advanced Statistical Inference, Calculus of Variations, Combinatorial Theory, Real Analysis, and Advanced Numerical Analysis
2. Thirty-six (36) units of approved courses, of which 18 must be in the 200 series (MATH 260 cannot be used without the Mathematics Graduate Committee’s approval.)
3. Completion of the courses MATH 131, MATH 132, MATH 151A, MATH 151B, MATH 146A, MATH 149A, or their equivalent. Also, MATH 165A is recommended, but not required

## Doctoral Degree

The Department of Mathematics offers the Ph.D. degree in Mathematics.

Specific requirements are as follows:

1. Passing the introductory courses in algebra (MATH 201A, MATH 201B, MATH 201C), complex analysis (MATH 210A, MATH 210B), real analysis (MATH 209A, MATH 209B, MATH 209C), and topology/differentiable manifolds (MATH 205A, MATH 205B, MATH 205C)
2. Passing at least three of the four qualifying examinations in algebra, complex analysis, real analysis and topology/differentiable manifolds with a grade of “A.” The fourth of the above qualifying examinations must be passed with a grade of “B” or better; a student is allowed to take the qualifying examination at most twice in each area
3. Completing four quarter-courses in mathematics numbered between 211 and 259

**Normative Time to Degree** 15 quarters

## Lower-Division Courses

*Mathematics advisory examinations are scheduled before each quarter. The UCR Mathematics Advisory Exam is a prerequisite for students who wish to enroll in math courses but have not received course equivalence in MATH 005, MATH 008A, MATH 008B, MATH 009A, MATH 015, MATH 022, or MATH 023.*

**MATH 002. Math Support Practicum (0)** Lecture, 4 hours; activity, 4 hours. Prerequisite(s): enrollment in the Summer Bridge MATH 002 program. Covers understanding course content and developing thinking and problem-solving skills. Introduces university life through exposure to test-taking techniques, effective note-taking strategies, time management, and university procedures and practices. Carries workload credit equivalent to 2 units but does not count towards graduation units. Offered in summer only. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of ENGL 002 or MATH 002.

**MATH 004. Introduction to College Mathematics for Business and the Social Sciences (5)** Lecture, 5 hours. Prerequisite(s): a sufficiently high score on the Mathematics Advisory Examination, as determined by the Mathematics Department. Not open to students in the Bourns College of Engineering or the College of Natural and Agricultural Sciences or to students majoring in Economics or Business Economics. Covers functions and their graphs, including linear and polynomial functions, zeroes, and inverse functions as well as exponential, logarithmic, and trigonometric functions and their inverses. Also includes counting, including elementary probability. Involves applications to business and social sciences. Credit is awarded for only one of MATH 004, MATH 005, or MATH 008A.

**MATH 005. Precalculus (5)** Lecture, 5 hours. Prerequisite(s): a sufficiently high score on the Mathematics Advisory Examination, as determined by the Mathematics Department. A study of inequalities, absolute value, functions, graphing, logarithms, trigonometry, roots of polynomials, counting, vectors, and other elementary concepts of mathematics Credit is awarded for only one of MATH 004, MATH 005, or MATH 008A.

**MATH 008A. Introduction to College Mathematics for the Sciences (5)** Lecture, 5 hours. Prerequisite(s): a sufficiently high score on the Mathematics Advisory Examination, as determined by the Mathematics Department. Covers functions and their graphs,

including linear and polynomial functions, zeroes, and inverse functions as well as exponential, logarithmic and trigonometric functions and their inverses. Also includes counting, including elementary probability. Involves applications to the natural sciences and engineering. Credit is awarded for only one of MATH 004, MATH 005, or MATH 008A.

**MATH 008B. Introduction to College Mathematics for the Sciences (5)** Lecture, 5 hours. Prerequisite(s): MATH 008A with a grade of "C-" or better or a sufficiently high score on the Mathematics Advisory Examination, as determined by the Mathematics Department. Not intended for students who have been awarded a grade of "C-" or better in MATH 005. Involves further study of trigonometry and analytic geometry. Introduction to the differential calculus of functions of a single variable. Credit is awarded for only one of MATH 008B, MATH 009A, or MATH 09HA.

**MATH 009A. First-Year Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005 with a grade of "C-" or better or equivalent. Introduction to the differential calculus of functions of one variable. Credit is awarded for only one of MATH 008B, MATH 009A, or MATH 09HA.

**MATH 009B. First-Year Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 008B with a grade of "C-" or better or MATH 009A with a grade of "C-" or better or MATH 09HA with a grade of "C-" or better. Introduction to the integral calculus of functions of one variable. Credit is awarded for only one of MATH 009B or MATH 09HB.

**MATH 009C. First-Year Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B with a grade of "C-" or better or MATH 09HB with a grade of "C-" or better. Further topics from integral calculus, improper integrals, infinite series, Taylor's series, and Taylor's theorem. Credit is awarded for only one of MATH 009C or MATH 09HC.

**MATH 09HA. First-Year Honors Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): a sufficiently high score on the placement examination, as determined by the Mathematics Department. Honors course corresponding to MATH 009A for students with strong mathematical backgrounds. Introduces the differential calculus of functions of one variable. Emphasis is on theory and rigor. Credit is awarded for only one of MATH 008B, MATH 009A, or MATH 09HA.

**MATH 09HB. First-Year Honors Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): a score of 3 or higher on the AB Advanced Placement Test in Mathematics or MATH 09HA with a grade of "B" or better. Honors course corresponding to MATH 009B for students with strong mathematical backgrounds. Introduces the integral calculus of functions of one variable. Emphasis is on theory and rigor. Credit is awarded for only one of MATH 009B or MATH 09HB.

**MATH 09HC. First-Year Honors Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 09HB with a grade of "B" or better. Honors course corresponding to MATH 009C for students with strong mathematical backgrounds. Covers further topics from integral calculus, improper integrals, infinite series, Taylor's series, and Taylor's theorem. Emphasis is on theory and rigor. Credit is awarded for only one of MATH 009C or MATH 09HC.

**MATH 010A. Calculus of Several Variables (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B with a grade of "C-" or better or MATH 09HB with a "C-" or better or equivalent. Topics include Euclidean geometry, matrices and linear functions, determinants, partial derivatives, directional deriva-

tives, Jacobians, gradients, chain rule, and Taylor's theorem for several variables.

**MATH 010B. Calculus of Several Variables (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better or equivalent. Covers vectors; differential calculus, including implicit differentiation and extreme values; multiple integration; line integrals; vector field theory; and theorems of Gauss, Green, and Stokes.

**MATH 011. Introduction to Discrete Structures (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009A or MATH 09HA; CS 010 or MATH 009B or MATH 09HB. Introduction to basic concepts of discrete mathematics with emphasis on applications to computer science. Topics include propositional and predicate calculi, elementary set theory, functions, relations, proof techniques, elements of number theory, enumeration, and discrete probability. Cross-listed with CS 011.

**MATH 015. Contemporary Mathematics for the Humanities, Arts, and Social Sciences (4)** Lecture, 3 hours; discussion, 1 hour. Designed to fulfill the breadth requirement for students in the humanities, arts, and social sciences. Illustrates the interaction of mathematics with other subject areas through the study of selected topics of contemporary mathematics. Topics are chosen from discrete mathematics, counting and probability, and the interaction between algebra and geometry.

**MATH 022. Calculus for Business (5)** Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): a sufficiently high score on the placement examination, as determined by the Mathematics Department, or MATH 004 with a grade of "C-" or better or MATH 005 with a grade of "C-" or better or MATH 008A with a grade of "C-" or better. Explores relations and functions (e.g. linear, polynomial, logarithmic, and exponential). Addresses differential calculus of functions of one and two variables, as well as integration (indefinite and definite) with applications to business and economic problems. Credit is not awarded for MATH 022 if a grade of "C-" or better has already been awarded for MATH 008B, MATH 009A, or MATH 09HA.

**MATH 046. Introduction to Ordinary Differential Equations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B with a grade of "C-" or better or MATH 09HB with a grade of "C-" or better or equivalent. Introduction to first-order equations, linear second-order equations, and Laplace transforms, with applications to the physical and biological sciences.

## Upper-Division Courses

*Courses numbered MATH 100–109 do not meet upper-division mathematics requirements.*

**MATH 104. Mathematics Education (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): sophomore, junior, or senior standing. Examines contemporary instructional strategies relating to mathematics education. Includes thinking skills and problem solving strategies applicable to number theory, logic patterns and functions, statistics, probability, and geometry and algebra. Cross-listed with EDUC 104.

**MATH 113. Applied Linear Algebra (5)** Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): concurrent enrollment in or completion of MATH 010A with a grade of "C-" or better. A study of matrices and systems of linear equations, determinants, Gaussian elimination and pivoting, vector spaces, linear independence and linear transformation, orthogonality, eigenvalues, and eigenvectors. Also examines selected topics and applications. Integrates numerical linear

algebra and extensive computer use with these topics. Credit is awarded for only one of MATH 113 or MATH 131.

**MATH 120. Optimization (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better; MATH 113 or MATH 131 with a grade of "C-" or better (may be taken concurrently). Introduction to classical optimization, including unconstrained and constrained problems in several variables, Jacobian and Lagrangian methods, and the Kuhn-Tucker conditions. Covers the basic concepts of linear programming, including the simplex method and duality with applications to other subjects.

**MATH 121. Game Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better. Examines games in extensive, normal, and characteristic form as models of conflict and/or cooperation. Covers two-person zero-sum games, minimax theorem, and relation to linear programming. Includes non-zero-sum games, Nash equilibrium theorem, bargaining, the core, and the Shapley value. Addresses economic market games.

**MATH 126. Combinatorics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 011/CS 011 with a grade of "C-" or better. A study of elements of combinatorics theory. Topics include chromatic polynomials, enumerating partitions of sets and integers, asymptotic enumeration, Polya theory, and Ramsey theory.

**MATH 131. Linear Algebra I (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in or completion of MATH 010A with a grade of "C-" or better. An introduction to vector spaces, matrices, and linear transformations. Credit is awarded for only one of MATH 113 or MATH 131.

**MATH 132. Linear Algebra II (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 113 with a grade of "C-" or better or MATH 131 with a grade of "C-" or better or equivalent. Further study of topics in linear algebra, including eigenvalues. Exploration of Hermitian and unitary matrices, positive definite matrices, and canonical forms.

**MATH 133. Geometry (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 113 or MATH 131 with a grade of "C-" or better, or consent of instructor. Analyzes elementary theory of affine and projective planes, the line at infinity, finite geometries, Euclidean and non-Euclidean geometries, groups of transformations, and other algebraic structures related to geometry.

**MATH 135A. Numerical Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010 or equivalent with a grade of "C-" or better; MATH 113 or MATH 131 with a grade of "C-" or better (may be taken concurrently). A study of numerical methods for determining solutions to nonlinear equations and simultaneous linear equations. Topics also include interpolation, techniques of error analysis, and computer applications.

**MATH 135B. Numerical Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010 with a grade of "C-" or better; MATH 113 or MATH 131 with a grade of "C-" or better; MATH 135A with a grade of "C-" or better. A continuation of MATH 135A. Explores numerical methods, numerical integration, and the numerical solution of ordinary differential equations.

**MATH 136. Introduction to the Theory of Numbers (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 113 or MATH 131 with a grade of "C-" or better. Covers prime and composite integers, number theoretic functions, diophantine equations, congruences, quadratic reciprocity, and additive arithmetic.

**MATH 137. Plane Curves (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 113 or MATH 131 with a grade of "C-" or better; MATH 171 and MATH 172 with a grade of "C-" or better are recommended. A study of the complex projective plane, homogeneous polynomials, plane curves, intersection multiplicities, and Bezout's theorem.

**MATH 138A. Introduction to Differential Geometry (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 113 or MATH 131 with a grade of "C-" or better. Examines elementary theory of curves and surfaces. Includes first and second fundamental forms.

**MATH 138B. Introduction to Differential Geometry (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better, MATH 138A with a grade of "C-" or better. Covers Gaussian curvature, geodesics, and the Gauss-Bonnet Theorem.

**MATH 140. Polynomials and Number Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 011/MATH 011 with a grade of "C-" or better; MATH 113 or MATH 131 with a grade of "C-" or better. Topics include number systems, elementary number theory, rings, fields, polynomials, congruencies, and applications of finite fields.

**MATH 141. Fractal Geometry with Applications (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better, MATH 046 with a grade of "C-" or better, concurrent enrollment or completion of MATH 144 with a grade of "C-" or better; or consent of instructor. Covers classical fractals; fractal dimensions; self-similar fractals; fractal curves and sets; random fractals; chaotic dynamics and fractals; iteration theory; Julia set; and the Mandelbrot set. Explores the beauty of fractals; mathematical description of irregular shapes (clouds, trees, coastlines, mountains, galaxies, lungs, snowflakes); and applications to physics, engineering, biology, and computer graphics.

**MATH 144. Introduction to Set Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better. Covers algebra of subsets of a set. Addresses algebra of relations and functions. Explores cardinal and ordinal numbers and their arithmetic operations. Includes the well-ordering theorem, transfinite induction, and Zorn's lemma.

**MATH 145A. Introduction to Topology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 144 with a grade of "C-" or better. Addresses elementary topology in metric spaces.

**MATH 145B. Introduction to Topology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 145A with a grade of "C-" or better. Explores geometric topology, algebra associated with finite complexes, and applications.

**MATH 146A. Ordinary and Partial Differential Equations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC with a grade of "C-" or better; MATH 010A with a grade of "C-" or better; MATH 046 with a grade of "C-" or better; MATH 131 (may be taken concurrently) or MATH 113 (may be taken concurrently) with a grade of "C-" or better or equivalent. Focuses on the theory of linear differential equations and transform methods.

**MATH 146B. Ordinary and Partial Differential Equations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 131 with a grade of "C-" or better, MATH 146A with a grade of "C-" or better. Further study of the theory of linear differential equations and problems in valuing ordinary differential equations.

**MATH 146C. Ordinary and Partial Differential Equations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better, MATH 146B with a grade of "C-" or better. Explores boundary value problems for partial differential equations, orthogonal expansions, and separation of variables.

**MATH 147. Introduction to Fourier Analysis and Its Applications (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC with a grade of "C-" or better; MATH 010B with a grade of "C-" or better; MATH 046 or MATH 146A with a grade of "C-" or better; MATH 113 or MATH 131 with a grade of "C-" or better (MATH 113 or MATH 131 may be taken concurrently). Covers Fourier series expansions of periodic functions, properties, and convergence; the Dirichlet kernel; Fourier integrals and the Fourier transform in one and several variables; the Plancherel theorem; and Fourier inversion. Includes applications of Fourier analysis (e.g., to spectral theory, numerical analysis, ordinary and partial differential equations, and wavelet transform).

**MATH 148. Introduction to Chaotic and Complex Dynamical Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better; MATH 046 or MATH 146A with a grade of "C-" or better; MATH 113 or MATH 131 with a grade of "C-" or better; or consent of instructor. Explores examples of dynamical systems, quadratic maps, maps of the circle, and higher-dimensional examples. Includes symbolic dynamics, Sarkovskii's theorem, hyperbolicity, and structural stability. Introduces chaotic dynamical systems and the period doubling route to chaos. Also introduces basic notions from complex dynamics. Includes the Julia set and the Mandelbrot set.

**MATH 149A. Probability and Mathematical Statistics (4)** Lecture, 3 hours; laboratory, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better, MATH 010B with a "C-" or better, concurrent enrollment in or completion of MATH 046 with a grade of "C-" or better. An introduction to the mathematical theory of probability and discrete and continuous distributions. Credit is awarded for only one of the MATH 149A, MATH 149B, and MATH 149C or STAT 160A, STAT 160B, and STAT 160C sequences.

**MATH 149B. Probability and Mathematical Statistics (4)** Lecture, 3 hours; laboratory, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better, MATH 010B with a grade of "C-" or better, MATH 046 with a grade of "C-" or better, MATH 149A with a grade of "C-" or better. A continuation of MATH 149A. Topics include sampling and limit distributions. Credit is awarded for only one of the MATH 149A, MATH 149B, and MATH 149C or STAT 160A, STAT 160B, and STAT 160C sequences.

**MATH 149C. Probability and Mathematical Statistics (4)** Lecture, 3 hours; laboratory, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better, MATH 010B with a grade of "C-" or better, MATH 046 with a grade of "C-" or better, MATH 149A with a grade of "C-" or better, MATH 149B with a grade of "C-" or better. A continuation of MATH 149B. Topics include tests of hypotheses, estimation, maximum likelihood techniques, regression, and correlation. Credit is awarded for only one of the MATH 149A, MATH 149B, and MATH 149C or STAT 160A, STAT 160B, and STAT 160C sequences.

**MATH 150A. Intermediate Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC with a grade of "C-" or better; MATH 010B with a grade of "C-" or better; MATH 144 with a grade of "C-" or better; or consent of instructor.

A study of the concepts and theory of single-variable calculus. Covers sequences through the fundamental theorem of calculus. Introduces sequences and series, continuity, differentiation, and integration. Credit is awarded for only one of MATH 150A or MATH 151A.

**MATH 150B. Intermediate Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 131 with a grade of "C-" or better; MATH 150A or MATH 151A with a grade of "C-" or better. MATH 132 with a grade of "C-" or better is recommended. A study of infinite series and multivariable advanced calculus. Credit is awarded for only one of MATH 150B or MATH 151B.

**MATH 151A. Advanced Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better, MATH 046 with a grade of "C-" or better, MATH 145A with a grade of "C-" or better; or consent of instructor. Addresses the development of mathematical analysis. Also covers real and complex numbers, sequences and series, continuity, differentiation, and the Riemann-Stieltjes integral. Credit is awarded for only one of MATH 150A or MATH 151A.

**MATH 151B. Advanced Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 151A with a grade of "C-" or better, or consent of instructor. A continuation of MATH 151A. Topics include sequences and series of functions, as well as functions of several variables. Credit is awarded for only one of MATH 150B or MATH 151B.

**MATH 151C. Advanced Calculus (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better, MATH 010B with a grade of "C-" or better, MATH 046 with a grade of "C-" or better, MATH 145A with a grade of "C-" or better, MATH 151A with a grade of "C-" or better, or consent of instructor. A continuation of MATH 151B. Further study of several variables, integration of differential forms, and Lebesgue integration.

**MATH 153. History of Mathematics (4)** Lecture, 3 hours; discussion, 1 hour, or term paper, 3 hours. Prerequisite(s): MATH 009C with a grade of "C-" or better or consent of instructor. A survey from a historical point of view of various developments in mathematics. Emphasizes the nineteenth and early twentieth centuries.

**MATH 165A. Introduction to Complex Variables (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better. An introduction to the theory of analytic functions of a complex variable. Includes mappings by elementary functions and complex integrals, as well as Cauchy's theorem, power series, and Laurent series.

**MATH 165B. Introduction to Complex Variables (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better, MATH 165A with a grade of "C-" or better. Topics include the theory of residues, conformal mapping, and applications to physical problems.

**MATH 168. Introduction to Mathematical Modeling (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 146B, and either MATH 150A or MATH 151A. A detailed study of how mathematical methods are applied to specific problems in the sciences and engineering fields. Utilizes examples taken from the theories of mechanical vibrations, population dynamics, and flow phenomena.

**MATH 171. Introduction to Modern Algebra (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 131 with a grade of "C-" or better, MATH 144 with a grade of "C-" or better. An introduction to the funda-

mental concepts of modern algebra. Covers groups, subgroups, quotient groups, homomorphisms, symmetry groups, fundamental properties of rings, integral domains, ideals, and quotient rings.

**MATH 172. Modern Algebra (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 171 with a grade of "C-" or better. Covers fundamental concepts of modern algebra. Includes groups, fields, polynomials, geometric constructions, algebraic coding, and boolean algebras.

**MATH 190. Special Studies (1-5)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable.

**MATH 194. Independent Reading (1-2)** Independent reading in materials not covered in course work. Normally taken in the senior year. Total credit for MATH 194 may not exceed 4 units.

**MATH 197. Research for Undergraduates (1-4)** Outside research, 3-12 hours. Prerequisite(s): upper-division standing; consent of instructor. Involves a research project on a problem in, or related to, mathematics conducted under the supervision of a Mathematics faculty member. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 8 units.

**MATH 198-I. Internship in Mathematics (1-4)** variable hours. Prerequisite(s): upper-division standing, with at least 12 units of upper-division credits toward the major. An academic internship to provide the student with career experience as a mathematician in a governmental, industrial, or research unit under the joint supervision of an off-campus sponsor and a faculty member in Mathematics. Each individual program must have the prior approval of both supervisors and the department chair. A final written report is required. Graded Satisfactory (S) or No Credit (NC). May be repeated for a total of 8 units.

## Graduate Courses

**MATH 201A. Algebra (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 171, MATH 172, or equivalents. Topics include basic theory of groups and rings, the Sylow theorems, solvable groups, and the Jordan-Holder theorem.

**MATH 201B. Algebra (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201A. Topics include rings, the functors  $\text{hom}$  and tensor, modules over a principle ideal domain, and applications to matrices.

**MATH 201C. Algebra (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201B. Topics include algebraic and transcendental extensions of fields and the Galois theory, and the tensor and exterior algebras.

**MATH 202. Numerical Linear Algebra (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 132. Covers standard decompositions of matrices and their computational uses, conditioning data, stability of solutions, and effective numerical methods for computing eigen values.

**MATH 205A. Topology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 145B or equivalent. An introduction to pointset topology.

**MATH 205B. Topology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 205A or equivalent. Covers homotopy theory and homology theory.

**MATH 205C. Topology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 205A, MATH 205B, or equivalents. Covers differential topology.

**MATH 207A. Ordinary Differential Equations (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 146B, MATH 151B; or consent of instructor. Covers existence, uniqueness, and stability of solutions to ordinary differential equations. Addresses important examples, dynamical flows associated to solutions, stable and unstable manifold phenomena, and boundary value problems. Also includes Lyapunov functions, Poincaré Map, and Sturm-Liouville Boundary Value Problems.

**MATH 207B. Partial Differential Equations I (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 010B, MATH 151B; or consent of instructor. Discusses various methods used in the study of partial differential equations (PDEs). Addresses energy estimates, characteristics, similarity solutions, numerics, and fundamental solutions. Focuses on concrete examples of PDEs including conservation laws, the transport equation, the heat equation, the porous media equation, the Navier-Stokes equation, the Laplace equation, and the wave equation.

**MATH 207C. Partial Differential Equations II (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 207B; or consent of instructor. A continuation of MATH 207B. Discusses various problems and methods in the study of partial differential equations (PDEs). Topics include Green's functions, boundary value problems, regularity of solutions, eigenvalue problems, energy methods, and variational methods.

**MATH 209A. Real Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 151C. Topics include Lebesgue measure, integration, and differentiation.

**MATH 209B. Real Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 209A. Topics include representation theorems, Hilbert space, Lebesgue spaces, and Banach spaces.

**MATH 209C. Real Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 209B. Topics include complex measures, general measure spaces, integration on product spaces, and Lebesgue spaces.

**MATH 210A. Complex Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 151C, MATH 165A. Studies include complex analytic functions, Cauchy's theorem, Cauchy's integral formula and the Laurent series, and the residue theorem.

**MATH 210B. Complex Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 210A. Studies include entire and meromorphic functions, normal families and the Riemann mapping theorem, and harmonic functions and the Dirichlet problem.

**MATH 211A. Ordinary Differential Equations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 146B, MATH 151C. Covers the existence and uniqueness of solutions; linear differential equations; singularities of the first and second kind; self-adjoint eigenvalue problems on a finite interval; and singular self-adjoint boundary-value problems for second-order equations.

**MATH 211B. Ordinary Differential Equations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 211A. Topics include the method of averaging and numerical integration, autonomous systems, the method of Liapounov, and stability for linear systems.

**MATH 212. Partial Differential Equations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 151C and MATH 165A. Classical theory of initial and boundary value problems for hyperbolic, parabolic and elliptic partial differential equations.

**MATH 216A. Combinatorial Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 111. Addresses the solving of combinatorial problems by studying their morphisms (transformations preserving the problem). Covers optimum path problems and their variants. Develops general techniques and the ability to work through the solutions of challenging special cases. Focuses on utilizing symmetry to systematically reduce a problem.

**MATH 216B. Combinatorial Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 216A. Addresses the solving of combinatorial problems by studying their morphisms (transformations preserving the problem). Covers optimum flow problems. Develops general techniques and work through the solutions of challenging special cases. Particular focus given to utilizing symmetry to systematically reduce a problem.

**MATH 217. Theory of Probability (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 209C. Topics include independence, strong limit theorems including the strong law and the Kolmogorov three-series theorem, weak law and the central limit theorem, the Helley-Bray theorem, and Bochner's theorem on positive definite functions.

**MATH 221. Several Complex Variables (4)** Lecture, 3 hours; research, 3 hours. Prerequisite(s): MATH 151A, MATH 151B, MATH 165A, MATH 165B. Hartog's theorems, domains of holomorphy, pseudoconvexity, Levi's problem, coherent analytic sheaves, Cartan's theorems A and B.

**MATH 222. Algebraic Groups (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201B, MATH 205A. Introduction to linear algebraic groups, structure, and representation

**MATH 223. Algebraic Number Theory (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201A. Topics include algebraic number theory, principal ideal domains, integral independence, algebraic number fields, classical ideal theory in Dedekind domains, classes of ideals, valuations, and p-adic numbers.

**MATH 224. Introduction to Homological Algebra (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201C or consent of instructor. Theory of derived functors and its application to rings and associative algebras.

**MATH 225. Commutative Algebra (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201C. Covers basic theory of commutative rings, primary decomposition, integral dependence and valuation rings, and the intersection theorem of Krull.

**MATH 226. Algebraic Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201B, MATH 205A. Introduction to the theory of modules over rings of differential operators. Topics include holonomic D-modules, functorial properties, and applications.

**MATH 227A. Lie Algebras (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201A, MATH 201B. Studies include basic definitions, solvable and nilpotent Lie algebras, and structure and classification of semisimple Lie algebras.

**MATH 227B. Lie Algebras (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 227A. Studies include enveloping algebras and representation theory, representations of semisimple Lie algebras.

bras, generalization to Kac-Moody Lie algebras, and modular Lie algebras.

**MATH 228. Functional Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 209A, MATH 209B, MATH 209C. Topological linear spaces; function spaces; linear operators; spectral theory; operational calculus; and further selected topics.

**MATH 230. Deformation Theory (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201B, MATH 232B. Introduction to deformation quantization. Topics include Hochschild complexes of associative algebras, differential graded Lie algebras, quasi-isomorphisms, Kontsevich's formality theorem, and star-products.

**MATH 232A. Geometry I (Introduction to Manifolds) (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 131 and MATH 151C. Basic notions and examples; vector fields and flows; tensors and vector bundles; differential forms, integration and deRham's theorem.

**MATH 232B. Geometry II (Introduction to Differential) (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 232A. Local and global theory of curves. Surfaces in  $R^3$ : the Gauss map, fundamental forms, curvature. Riemannian geometry: the Levi-Civita connection, curvature, geodesics, exponential map, completeness, Gauss-Bonnet theorem for surfaces.

**MATH 233. Comparison Geometry (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 232B or consent of instructor. Explores the question of how curvature affects topology.

**MATH 241. Mathematical Physics: Classical Mechanics (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 205A, MATH 205B, MATH 205C; or PHYS 205; or consent of instructor. Hamilton's principle of least action. Variational methods and Lagrange's equations. Hamilton's equations. Introduction to symplectic geometry and its applications to classical mechanics. Poisson brackets. Conserved quantities and Noether's theorem. Examples of Hamiltonian and dissipative dynamical systems. Introduction to classical chaos.

**MATH 242. Mathematical Physics: Quantum Mechanics (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 209A, MATH 209B, MATH 209C, MATH 228; or consent of instructor. Foundations of quantum theory together with the relevant mathematics. Probabilistic interpretation of quantum mechanics, self-adjoint operators and physical observables, noncommutativity and the uncertainty principle. Spectral theory for (unbounded) self-adjoint operators. Stone's theorem and other topics.

**MATH 243A. Algebraic Geometry (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 201A, MATH 201B. Topics include algebraic varieties in affine and projective space and their basic attributes such as dimension, degree, tangent space, and singularities; and products, mappings, and correspondences.

**MATH 243B. Algebraic Geometry (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 243A. Topics include further study of varieties, sheaves, and cohomology and detailed study of curves and special topics.

**MATH 245. Analytic Number Theory (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 165B, MATH 209A; or consent of instructor. Explores the key structures of analytic number theory. Addresses the theory of the Riemann zeta function:

functional equation, analytic continuation, and zero-free regions. Illustrates application to the prime number theorem. Considers the Mellin transform and other Dirichlet series, including Dirichlet L-functions.

**MATH 246A. Algebraic Topology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 205A; MATH 205B or equivalent. Topics include simplicial and cell complexes, polyhedra, manifolds, homology and cohomology theory, and homotopy theory.

**MATH 246B. Algebraic Topology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 246A. Covers topics such as topological indices, Lefschetz fixed point theory, Poincaré duality, vector bundles and characteristic classes, and transformation groups.

**MATH 247. Theory of Distributions and Applications (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 146A, MATH 209C; or consent of instructor. Explores approximation of differentiable functions. Addresses theory of distributions, including basic properties, differentiation, and key operations. Covers applications to multivariable calculus and classical equations of mathematical physics. Examines particular spaces of distributions; convolution and Fourier transform; fractional differentiation; Fourier integral operators; and pseudo differential operators.

**MATH 248. Harmonic Analysis and Applications (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 146C, MATH 165B, MATH 209C; or consent of instructor. A study of Fourier series. Includes summability methods, kernels, Fourier transform, unitarity, applications to the uncertainty principle, and distributional Fourier transform. Introduces Hardy spaces, singular integral operators, and wavelet theory and its applications. Other topics include interpolation of linear operators and spectral analysis and applications.

**MATH 249. Introduction to Dynamical Systems (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 146B; MATH 151C; MATH 205C or MATH 232A; or consent of instructor. Explores diffeomorphisms and flows, Poincaré maps, and Hamiltonian flows. Includes hyperbolicity, homoclinic points, center manifold theorem, structural stability, and Hopf bifurcations. Explores the Poincaré-Birkhoff theorem, basin of attraction and strange attractors, and Lyapunov exponents and entropy. Introduces chaotic dynamical systems, KAM theory, and complex dynamics.

**MATH 260. Seminar (1-4)** variable hours. Prerequisite(s): consent of department. Seminar on special topics of mathematics in preparation for individual research. Course is repeatable.

**MATH 289. Colloquium in Mathematics (1)** Prerequisite(s): graduate standing. Specialized discussions by staff, students and visiting scientists on current research topics in Mathematics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MATH 290. Directed Studies (1-6)** Prerequisite(s): consent of instructor. Research and special studies in mathematics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MATH 291. Individual Study in Coordinated Areas (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing in Mathematics or consent of instructor. Designed to advise and assist candidates with exam preparation Graded Satisfactory (S) or No Credit (NC). Course is repeatable prior to successful completion of the qualifying examination for M.A. and M.S. students

to a maximum of 6 units and for Ph.D. students to a maximum of 12 units.

**MATH 299. Research for Thesis or Dissertation (1-12)** Prerequisite(s): consent of department. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**MATH 302. Apprentice Teaching (2-4)** Lecture, 0-1 hour; seminar, 2-4 hours; consultation, 1-2 hours. Prerequisite(s): appointment as a teaching assistant or associate in Mathematics. Supervised training for teaching in lower- and upper-division Mathematics courses. Topics include effective teaching methods, such as those involved in leading mathematics discussion sections, preparing and grading examinations, and relating to students. Required each quarter of all teaching assistants and associates in Mathematics. Units to be decided in consultation with graduate advisor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Mechanical Engineering

**Subject abbreviation: ME**  
**The Marlan and Rosemary Bourns**  
**College of Engineering**

Thomas Stahovich, Ph.D., Chair  
Department Office, A342 Bourns Hall  
(951) 827-5830; [www.me.ucr.edu](http://www.me.ucr.edu)

### Professors

Reza Abbaschian, Ph.D., *Distinguished Professor*  
Cengiz Ozkan, Ph.D.  
Thomas Stahovich, Ph.D.  
Kambiz Vafai, Ph.D.  
Akula Venkatram, Ph.D.  
Guanshui Xu, Ph.D.

### Associate Professors

Guillermo Aguilar, Ph.D.  
Javier Garay, Ph.D.  
Marko Princevac, Ph.D.

### Assistant Professors

Elisa Franco, Ph.D.  
Heejung Jung, Ph.D.  
Lorenzo Mangolini, Ph.D.  
Masaru P. Rao, Ph.D.  
Hideaki Tsutsui, Ph.D.  
Sundararajan Venkatadriagram, Ph.D.

\*\*

### Adjunct Professor

Shankar Mahalingam, Ph.D.

### Adjunct Assistant Professor

Christopher Dames, Ph.D.

### Cooperating Faculty

Bahman Anvari, Ph.D. (Bioengineering)  
Bir Bhanu, Ph.D. (Electrical Engineering)  
Ashok Mulchandani, Ph.D. (Chemical and Environmental Engineering)

## Major

The design and production of machines requires a broad-based education. The Mechanical Engineering degree program has been structured to provide the necessary background in chemistry, physics, and advanced

math to achieve success in the advanced engineering subjects. In addition, students are taught the basics of Mechanical Engineering while learning about the latest developments and experimental techniques.

The Mechanical Engineering program objectives are to produce mechanical engineers who:

- have the knowledge and skills to adapt to the changing engineering environment in industry
- are able to pursue and succeed in graduate studies
- have the educational breadth and the intellectual discipline required to enter professional careers outside engineering, such as business and law
- have an ability to work in multi-disciplinary teams
- engage in a lifetime of learning

The Mechanical Engineering B.S. degree at UCR is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700. For more details see [www.me.ucr.edu](http://www.me.ucr.edu).

All undergraduates in the College of Engineering must see an advisor at least annually. Visit [student.engr.ucr.edu](http://student.engr.ucr.edu) for details.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Mechanical Engineering major uses the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. BIOL 005A, BIOL 05LA
2. MATH 008B or MATH 009A
3. PHYS 040A, PHYS 040B, PHYS 040C

## Major Requirements

1. Lower-division requirements (72 units)
  - a) BIOL 005A, BIOL 05LA
  - b) CHEM 001A, CHEM 001B, CHEM 011A, CHEM 011B
  - c) EE 001A, EE 011A
  - d) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
  - e) ME 002, ME 009, ME 010, ME 018
  - f) PHYS 040A, PHYS 040B, PHYS 040C
2. Upper-division requirements (77 units)
  - a) ME 100A, ME 103, ME 110, ME 113, ME 114, ME 116A, ME 118, ME 120, ME 135, ME 170A, ME 170B, ME 174, ME 175A, ME 175B, ME 175C

b) STAT 100A

c) Choose one Focus Area:

(1) Materials and Structures

Sixteen (16) units of technical electives chosen from ME 100B, ME 116B, ME 122, ME 153, ME 156, ME 180, ME 197

(2) Energy and Environment

Sixteen (16) units of technical electives chosen from ME 100B, ME 116B, ME 117, ME 136, ME 137, ME 197

(3) Design and Manufacturing

Sixteen (16) units of technical electives chosen from ME 121, ME 122, ME 130, ME 131, ME 133, ME 153, ME 156, ME 176, ME 180, ME 197

(4) General Mechanical Engineering

Sixteen (16) units of technical electives chosen from the following list, in consultation with an advisor: ME 100B, ME 116B, ME 117, ME 121, ME 122, ME 130, ME 131, ME 133, ME 136, ME 137, ME 138, ME 153, ME 156, ME 176, ME 180, ME 197

Visit the Student Affairs Office in the College of Engineering or [student.engr.ucr.edu](http://student.engr.ucr.edu) for a sample program.

## Graduate Program

The Department of Mechanical Engineering offers graduate educational programs leading to M.S. and Ph.D. degrees in Mechanical Engineering. Broad areas of research include 1) mechanics and materials, 2) fluids and thermal sciences and 3) information computation and design. Specific research focus areas include the following:

- Air quality, small and large-scale pollutant dispersion in urban flows, turbulent combustion and wildland fire behavior, engine emissions and nanoparticle science, thermal and electrical properties of nanowires and nanotubes, direct energy conversion, porous media and multiphase transport, bioheat transfer, biomedical optics, and medical laser applications
- Wafer fab processing, thin film mechanics and nanotechnology, bio-inspired materials, mechanical behavior of thin films and other small-featured structures, mechanics of interfaces and surfaces, mechanical properties of carbon nanotubes and ferroelectric/piezoelectric materials, sensing and imaging, mechanics of geophysical materials, advanced material synthesis, composites, MEME, BioMEMS, biomedical devices, and processing of nanocrystalline materials
- Artificial intelligence, computer-aided design or manufacturing, process planning, sensor networks, and distributed computing and control

Visit [www.me.ucr.edu/programs/gradindex.html](http://www.me.ucr.edu/programs/gradindex.html), for detailed information on the research

programs of individual faculty members.

**Combined B.S. + M.S. Five-Year Program** The college offers a combined B.S. + M.S. program in Mechanical Engineering designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, a combined SAT Reasoning score above 1950 (or ACT plus Writing equivalent), complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

**Admission** In addition to the following requirements, all applicants must meet the general requirements of the Riverside Division of the Academic Senate and the UCR Graduate Council as set forth in this catalog under the Graduate Studies section.

**Language Requirement** All international students whose first language is not English must demonstrate proficiency in spoken English by securing at least a "conditional pass" score on the TAST or SPEAK test before they can be appointed as a TA. However, to be considered for subsequent TA appointments, they must secure a "clear pass" on the TAST or SPEAK. The fee associated with this test is paid by the department for the first attempt only. The TAST or SPEAK requirement is, however, waived for international students who are appointed as GSRs or are self-supported throughout their studies at UCR.

## Master's Degree

The Department of Mechanical Engineering offers the M.S. degree in Mechanical Engineering.

**Admission** Applicants should have an undergraduate degree in engineering, physical sciences, or mathematics; a satisfactory GPA for the last two years of their undergraduate studies; and high scores on the GRE General Test. All official transcripts, official GRE reports and three letters of recommendation must be submitted for evaluation. Foreign students and permanent residents whose first language is not English must also submit an acceptable TOEFL test score prior to admittance; the minimum TOEFL exam score is 550 (paper-based), 213 (computer-based), or 80 (Internet-based).

The M.S. degree in Mechanical Engineering can be earned by either completing a thesis (Plan I), which reports a creative investigation of a defined problem, or passing a comprehensive examination (Plan II). A minimum of three quarters of residency is required. Students should enroll in 12 units each quarter unless the graduate advisor grants an exception.

Course work used to satisfy the student's undergraduate degree requirements may not be applied toward the 36-unit M.S. requirement.

**Plan I (Thesis)** requires completion of a minimum of 36 units of upper-division and gradu-

ate-level approved course work and submission of an acceptable thesis. At least 24 of these units must be in graduate courses (200-series courses), a minimum of sixteen of these units being Mechanical Engineering graduate courses (ME 200 or higher, excluding ME 250, ME 290, ME 297, ME 298I, and ME 299). The student must take at least 3 units of seminar (ME 250) and at least 7 but no more than 11 units of directed or thesis research credits (ME 297 or ME 299). No more than 8 units of course work may be satisfied with directed studies (ME 290) or individual internship (ME 298I). Students must defend the thesis.

An acceptable M.S. thesis must be submitted. The M.S. thesis may be based on:

1. A research or advanced design project, either analytical, computational or experimental;
2. An extensive report consisting of theoretical, computational or experimental contribution to mechanical engineering.

The student's M.S. Thesis Committee is responsible for approving the thesis. The thesis committee is composed of three members (including the research advisor).

**Plan II (Comprehensive Examination)** requires completion of a minimum of 36 units of upper-division and graduate-level approved course work and successfully passing a comprehensive examination. At least 24 of these units must be in graduate courses (200 series courses), a minimum of sixteen of these units being Mechanical Engineering graduate courses (ME 200 or higher, excluding ME 250, ME 290, ME 297, ME 298I, and ME 299). The student must take 1 unit of seminar (ME 250) and no more than 7 units of directed studies (ME 290) or individual internship (ME 298I). The comprehensive examination covers a broad range of topics chosen from upper-division and graduate courses the student has taken. This examination is prepared and administered by the graduate program committee. It is held during the spring quarter of every year.

**Normative Time to Degree** Two years

Refer to the department's graduate program guidelines for further details.

## Doctoral Degree

The Department of Mechanical Engineering offers the Ph.D. degree in Mechanical Engineering.

**Admission** An M.S. or equivalent degree in engineering or physical sciences or mathematics is normally required for admission to the Ph.D. program, although applicants with exceptional undergraduate or research record may be admitted directly into the Ph.D. program without an M.S. degree. Applicants for the Ph.D. degree must also meet the same requirements as for the master's programs. Students in the M.S. program of Mechanical Engineering who desire to pursue the Ph.D. degree must formally apply for admission to the Ph.D. program.

The procedure for satisfying the requirements

for the Ph.D. degree in Mechanical Engineering at UCR consists of four principal parts:

1. Successful completion of an approved program of course work
2. Passing a written and oral preliminary examination
3. Oral defense of a dissertation proposal written and submitted by the candidate
4. Defense and approval of the dissertation

**Course Work** A course work plan should be formulated by the student and his/her faculty advisor within the first quarter after admission to the Ph.D. program and must be approved by the student's Ph.D. advisor and Ph.D. Examination Committee. It is understood that changes to this may occur as the student's research progresses. These changes should be documented after consultation with the Ph.D. advisor and Ph.D. Examination Committee.

The Ph.D. degree will require a coherent program of at least 72 units of upper-division undergraduate or graduate-level approved course work. At least 24 of these units must be in graduate courses (200-series courses), a minimum of 8 of these being Mechanical Engineering graduate courses (ME 200 or higher, excluding ME 250, ME 290, ME 297, ME 298I, and ME 299). The student must also take 6 units of seminar (ME 250) and at least 36 units of directed or thesis research credits (ME 297 or ME 299).

Courses taken as part of the Ph.D. requirement in Mechanical Engineering at UCR can be used to satisfy the course requirements for an M.S. in Mechanical Engineering at UCR and vice versa.

**Normative Time to Degree** Five years

Refer to the department's graduate program guidelines for further details

**Written and Oral Preliminary Examination** The examination aims to screen candidates for pursuing doctoral studies. It is administered by the graduate program committee and is composed of two sessions:

Session 1: Engineering Principles

Session 2: An area of specialty in mechanical engineering

Normally, both sessions are completed within a one-week period. Session 1 is a written examination designed to test understanding of concepts and methods used in mechanical engineering. It covers three subject areas to be selected by the student. For details, consult the departmental guidelines. Problems will be typical of those encountered in upper-division courses of undergraduate engineering curricula in U.S. schools with graduate-level understanding. Session 2 is conducted orally and assesses the student's ability to conduct independent research. Consult departmental guidelines for details. The preliminary examination is normally offered once every year in the spring quarter.

**Dissertation and Final Oral Examination** After

successfully completing the preliminary examination, the student, with advice from the advisor, recommends a qualifying committee and prepares a dissertation proposal. The dissertation proposal consists of a written document and an oral presentation or defense. Typically, the student submits a dissertation proposal to the qualifying committee within one year after successfully completing the preliminary examination. The qualifying committee chair normally schedules an oral defense within one month of the written proposal submission. The presentation is given only to the qualifying committee members. The student is advanced to candidacy after successfully completing this examination.

After completing the dissertation research, a written draft copy of the completed dissertation must be submitted to the dissertation committee for review, evaluation, and determination of whether the draft thesis is ready for oral defense. Once a draft has been approved for defense, an oral defense of the dissertation is scheduled and is open to the entire academic community. This defense consists of a presentation, followed by a question-and-answer period conducted by the dissertation committee and the audience. After successfully defending the dissertation, the candidate must submit final copies of the dissertation that comply with the format requirements set forth by the Graduate Division. Copies are given to the department and the dissertation advisor, in addition to those required by the Graduate Division.

Consult departmental guidelines for appointments to qualifying and dissertation committees.

Refer to the department's graduate program guidelines for further details.

## Lower-Division Courses

### ME 001A. Introduction to Mechanical Engineering (1)

Laboratory, 3 hours. Prerequisite(s): none. An introduction to mechanical engineering as a field of study and as a profession. Orients students to the curriculum, faculty, and resources in the Department of Mechanical Engineering. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of ENGR 010 or ME 001A.

### ME 001B. Introduction to Mechanical Engineering (1)

Laboratory, 3 hours. Prerequisite(s): none. An introduction to mechanical-engineering and computer-aided design. Students design, analyze, prototype, and test a mechanical device using modern methods. Graded Satisfactory (S) or No Credit (NC).

### ME 001C. Introduction to Mechanical Engineering (1)

Laboratory, 3 hours. Prerequisite(s): MATH 008B or MATH 009A or MATH 09HA. An introduction to engineering problem solving and computations using EXCEL and MATLAB. Topics include functions, scalar and array operations, graphics, linear algebra, and symbolic mathematical operations with applications in mechanical engineering.

### ME 002. Introduction to Mechanical Engineering (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005 or equivalent. Enrollment priority is given to Mechanical Engineering majors. An introduction to the field of mechanical engineering. Topics include

the mechanical engineering profession; machine components; forces in structures and fluids; materials and stresses; thermal and energy systems; machine motion; and machine design.

**ME 003. How Things Work: The Principles Behind Technology (4)** Lecture, 3 hours; discussion, 1 hour. Introduces the basic physical principles of engineering systems from everyday life, such as automobiles, computers, and household appliances. Topics include conservation laws and the physics and chemistry of engineering systems.

**ME 004. Energy and the Environment (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers energy conservation, energy sources, market dynamics, and climate change. Addresses cultural, political, and social trends and their impact on the ecosystem. Discusses renewable and nonrenewable energy sources such as solar, wind, wave, tides, geothermal, hydroelectric, fossil fuels, nuclear, and biomass. Technical background not required.

**ME 009. Engineering Graphics and Design (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 002 (may be taken concurrently). Covers graphical concepts and projective geometry relating to spatial visualization and communication in design. Includes technical sketching, instrument drawing, and computer-aided drafting and design.

**ME 010. Statics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C, PHYS 040A. Enrollment priority is given to Mechanical Engineering, Material Science and Engineering and Environmental Engineering majors. Covers equilibrium of coplanar force systems; analysis of frames and trusses; non-coplanar force systems; friction; and distributed loads.

**ME 018. Introduction to Engineering Computation (3)** Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): ME 002. An introduction to the use of MATLAB in engineering computation. Covers scripts and functions, programming, input/output, two- and three-dimensional graphics, and elementary numerical analysis.

## Upper-Division Courses

**ME 100A. Thermodynamics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A, ME 018, PHYS 040B. Introduces basic concepts and applications of thermodynamics relevant to mechanical engineering. Topics include work and energy, the first law of thermodynamics, properties of pure substances, system and control volume analysis, the Carnot cycle, heat and refrigeration cycles, the second law of thermodynamics, entropy, and reversible and irreversible processes. Credit is awarded for only one of CHE 100 or ME 100A.

**ME 100B. Thermodynamics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A. Topics include the second law of thermodynamics, entropy function, entropy production, analysis of cycles, vapor power systems, gas power systems, refrigeration and heat pump systems, equations of state, thermodynamic property relations, ideal gas mixtures and psychrometrics, multicomponent systems, combustion, and reacting mixtures.

**ME 103. Dynamics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046, ME 010 with a grade of "C-" or better, ME 018. Topics include vector representation of kinematics and kinetics of particles; Newton's laws of motion; force-mass-acceleration, work-energy, and impulse-momentum methods; kinetics of systems of particles; and kinematics and kinetics of rigid bodies.

**ME 110. Mechanics of Materials (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046, ME 010 with a grade of "C-" or better, ME 018. Topics include mechanics of deformable bodies subjected to axial, torsional, shear, and bending loads; combined stresses; columns; energy design; and their applications to the design of structures.

**ME 113. Fluid Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046, PHYS 040B, ME 010 with a grade of "C-" or better, ME 018. Introduces principles of fluid mechanics relevant to mechanical engineering. Topics include shear stresses and viscosity, fluid statics, pressure, forces on submerged surfaces, Bernoulli and mechanical energy equations, control volume approach, mass conservation, momentum and energy equations, the differential approach, turbulent flow in pipes, and lift and drag. Credit is awarded for only one of CHE 114 or ME 113.

**ME 114. Introduction to Materials Science and Engineering (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001B, PHYS 040C; upper-division standing. Covers materials classification, atomic structure and interatomic bonding, crystal structure of metals, imperfections in solids, diffusion, mechanical properties of engineering materials, strengthening mechanisms, basic concepts of fracture and fatigue, phase diagrams, ceramics, polymers, and composites.

**ME 116A. Heat Transfer (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046, ME 100A, ME 113 (ME 113 may be taken concurrently). Introduces the analysis of steady and transient heat conduction, fin and heat generating systems, two-dimensional conduction, internal and external forced convection, natural convection, radiation heat transfer, heat exchangers, and mass transfer. Credit is awarded for only one of CHE 116 or ME 116A.

**ME 116B. Heat Transfer (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 116A. Covers analytical and numerical methods in heat transfer and fluid mechanics. Topics include heat conduction and convection, gaseous radiation, boiling and condensation, general aspects of phase change, mass transfer principles, multimode heat transfer and the simulation of thermal fields, and the heat transfer process.

**ME 117. Combustion and Energy Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A, ME 113, ME 116A. Discusses premixed and diffusion flames; fuel-air thermochemistry; combustion-driven engine design and operation; engine cycle analysis; fluid mechanics in engine components; pollutant formation; and gas turbines.

**ME 118. Mechanical Engineering Modeling and Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046, ME 018. Introduces data analysis and modeling used in engineering through the software package MATLAB. Numerical methods include descriptive and inferential statistics, sampling and bootstrapping, fitting linear and nonlinear models to observed data, interpolation, numerical differentiation and integration, and solution of systems of ordinary differential equations. Final project involves the development and evaluation of a model for an engineering system. Credit is awarded for only one of ENGR 118 or ME 118.

**ME 120. Linear Systems and Controls (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 001A, EE 011A, ME 103. Introduces the modeling and analysis of dynamic systems, emphasizing the common features of mechanical, hydraulic, pneumatic, thermal, electrical, and electromechanical systems. Controls are introduced through state equations, equilibrium, linearization, stability, and time and frequency domain analysis.

**ME 121. Feedback Control (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 118, ME 120. Introduces students to the analysis and design of feedback control systems using classical control methods. Topics include control system terminology, block diagrams, analysis and design of control systems in the time and frequency domains, closed-loop stability, root locus, Bode plots, and an introduction to analysis in state-space.

**ME 122. Vibrations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 103. Covers free and forced vibration of discrete systems with and without damping resonance; matrix methods for multiple degree-of-freedom systems; normal modes, coupling, and normal coordinates; and use of energy methods.

**ME 130. Kinematic and Dynamic Analysis of Mechanisms (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 009, ME 103. Explores the kinematic analysis of planar mechanisms including linkages, cams, and gear trains. Introduces concepts of multibody dynamics.

**ME 131. Design of Mechanisms (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 130. Involves design of planar, spherical, and spatial mechanisms using both exact and approximate graphical and analytical techniques. Requires a computer-aided design project.

**ME 133. Introduction to Mechatronics (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 120. Introduces hardware, software, sensors, actuators, physical systems models, and control theory in the context of control system implementation. Covers data acquisition (Labview), sensors, actuators, electric circuits and components, semiconductor electronics, logic circuits, signal processing using analog operational amplifiers, programmable logic controllers, and microcontroller programming and interfacing. Uses MATLAB and Simulink.

**ME 135. Transport Phenomena (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A, ME 113, ME 116A. Introduces new concepts of thermodynamics, fluid mechanics, and heat transfer: sychrometry, combustion, one-dimensional compressible flow, and turbomachinery. Integrates the most important concepts of transport of momentum, heat, and mass.

**ME 136. Environmental Impacts of Energy Production and Conversion (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A, ME 113, ME 116A. Covers thermodynamics, heat transfer, and fluid mechanics as applied to the examination of the environmental impacts of energy production and conversion. Topics include pollution associated with fossil fuel combustion, environmental impacts of energy use, turbulent transport of pollutants, and principles used in the design of pollution control equipment.

**ME 137. Environmental Fluid Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A, ME 113. Covers the application of fluid mechanics to flows in the atmosphere and oceans. Topics include hydrostatic balance, Coriolis effects, geostrophic balance, boundary layers, turbulence, tracer and heat transport.

**ME 138. Transport Phenomena in Living Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 105 or ME 113, MATH 046, PHYS 040B. An introduction to the application of the basic conservation laws of mechanics (mass, linear momentum, and energy) to the modeling of complex biological systems. Emphasizes how these concepts can explain and predict life processes.

**ME 153. Finite Element Methods (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 118. Covers weak form formulation, the Galerkin method and its computational implementation, mesh generation, data visualization, as well as programming finite element codes for practical engineering applications.

**ME 156. Mechanical Behavior of Materials (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): senior standing; ME 110; ME 114. Introduces the theory and experimental techniques for testing the mechanical behavior of materials and structures. Covers the fundamental mechanisms of deformation and failure of metals, ceramics, polymers, composite materials, and electronic materials as well as structural design and materials selection.

**ME 170A. Experimental Techniques (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 001A, EE 01LA, ME 118 (ME 118 may be taken concurrently). Covers the principles and practice of measurement and control, and the design and implementation of experiments. Topics include dimensional analysis, error analysis, signal-to-noise problems, filtering, data acquisition and data reduction, and statistical analysis. Includes experiments on the use of electronic devices and sensors, and practice in technical report writing.

**ME 170B. Experimental Techniques (4)** Laboratory, 6 hours; discussion, 2 hours. Prerequisite(s): ME 103, ME 110, ME 113, ME 116A, ME 170A. Analysis and verification of engineering theory using laboratory measurements in advanced, project-oriented experiments involving fluid flow, heat transfer, structural dynamics, thermodynamic systems, and electro-mechanical systems.

**ME 174. Machine Design (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 009, ME 103 (can be taken concurrently), ME 110, ME 114. An introduction to the fundamentals of strength-based design. Topics include deflection and stiffness, static failure, and fatigue failure.

**ME 175A. Professional Topics in Engineering (2)** Lecture, 2 hours. Prerequisite(s): senior standing in Mechanical Engineering major; ME 009. Topics include technical communication, team work, project management, engineering economics, professional ethics, and computer-aided design. Satisfactory (S) or No Credit (NC) grading is not available.

**ME 175B. Mechanical Engineering Design (3)** Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): senior standing in Mechanical Engineering. ME 113, ME 116A, ME 170A, ME 174, ME 175A (may be taken concurrently). Outlines the defining of a design problem and the conception and detail of the design solution. Explores design theory, design for safety, reliability, manufacture, and assembly. Graded In Progress (IP) until ME 175B and ME 175C are completed, at which time a final, letter grade is assigned.

**ME 175C. Mechanical Engineering Design (3)** Lecture, 1 hour; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): senior standing in Mechanical Engineering; ME 175B. Students create, test, and evaluate a prototype based on the project design generated in ME 175B. Lecture topics include prototyping techniques, design verification, and special topics in design. Satisfactory (S) or No Credit (NC) grading is not available.

**ME 176. Sustainable Product Design (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 103, ME 110, ME 113, ME 116A. Introduces the principles of sustainable product design. Topics include life cycle design; design for reliability, maintainability, and recycling/reuse/remanufacture; materials selection; and manufacturing processes. Includes project in

which students analyze the environmental impact of a product and redesign it to reduce the impact. Credit is awarded for only one of ME 176 or ME 210.

**ME 180. Optics and Lasers in Engineering (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): senior standing; ME 010, ME 110, ME 170A. Focuses on the principles of optics and lasers, optical measurement techniques, and laser material interactions. Involves applications of optical methods using coherent and incoherent lights in mechanical engineering deformation and stress analysis; optical data acquisition and image analysis; and applications of lasers in material processing and characterization.

**ME 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): consent of instructor, department chair, and Mechanical Engineering Undergraduate Program Committee chair. Individual study to meet special curricular needs. Requires a final written report. Course is repeatable to a maximum of 9 units.

**ME 197. Research for Undergraduates (1-4)** Outside research, 3-12 hours. Prerequisite(s): consent of instructor and Mechanical Engineering Undergraduate Program Committee chair. Directed research in a particular subject relevant to mechanical engineering. Requires a final written technical report. Course is repeatable to a maximum of 8 units.

## Graduate Courses

**ME 200. Methods of Engineering Analysis (4)** Lecture, 4 hours. Prerequisite(s): graduate standing in engineering or consent of instructor. Topics include linear algebra theory, vector spaces, eigenvalue problems, complex analytic functions, contour integration, integral transforms, and basic methods for solving ordinary and partial differential equations in mechanical engineering applications.

**ME 201. Computational Methods in Engineering (4)** Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Explores numerical methods with computer applications. Topics include solution of nonlinear algebraic equations, solution of systems of linear equations, interpolation, integration, statistical description of data, model fitting, Fast Fourier Transform and applications, and numerical solution of ordinary and partial differential equations.

**ME 202. Spectral Computational Methods (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): ME 200 or equivalent; ME 240A is recommended. Introduces data analysis, including discrete Fourier transforms, sampling theorem, and power spectra. Reviews Sturm-Liouville eigenfunction expansions, Gibbs phenomenon, convergence theorems, and Chebyshev transforms. Additional topics include Galerkin, tau, collocation, and pseudospectral methods, aliasing, time-advancement, and numerical stability. Explores applications to incompressible Navier-Stokes equations, compressible flows, reacting flows, and complex geometries. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes.

**ME 203. Design and Analysis of Engineering Experiments (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduces research methods in engineering. Topics include design of experiments, basic statistical tools, data analysis in the time-domain and frequency domain, machine learning and pattern recognition approaches, and computational tools. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ME 210. Sustainable Product Design (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduces the principles of sustainable product design. Topics include life cycle design; design for reliability, maintainability, and recycling/reuse/remanufacture; materials selection; and manufacturing processes. Includes project in which students analyze the environmental impact of a product and redesign it to reduce the impact. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes. Credit is awarded for only one of ME 176 or ME 210.

**ME 221. Advanced Dynamics (4)** Lecture, 4 hours. Prerequisite(s): ME 103 or consent of instructor. Introduces spatial kinematics and dynamics of a rigid body, multi-rigid-body systems, and robot manipulators. Topics include Newton's and Euler's laws, Lagrange's equations, Hamilton's equations, and variational principles.

**ME 222. Advanced Robotics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 236; ME 120 or equivalent. Topics include robot navigation; description of robot sensors and their characteristics; sensor data processing; feature extraction; and matching. Also covers representations of space for mapping; map-based localization; simultaneous localization and mapping; image-based motion estimation; and motion planning. Cross-listed with EE 245.

**ME 230. Computer-Aided Engineering Design (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces fundamentals of interactive computer graphics, three-dimensional representations of curves and surfaces, Bezier parameterizations, and optimization methods. Demonstrates applications of computer graphics and computational geometry to mechanical system simulations, computer-aided design, and engineering design.

**ME 231. Pen-Based Computing (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor; computer programming experience. Introduces computational techniques for pen-based user interfaces. Covers fundamental issues such as ink segmentation, sketch parsing, and shape recognition. Explores the topic of sketch understanding, including reasoning about context and correcting errors. Also addresses issues related to building practical pen-based systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 233.

**ME 232. Computational Design Tools (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the theoretical foundations and practical application of computational techniques for engineering design. Topics include geometric modeling, numerical optimization, and artificial intelligence techniques. Includes programming projects in which both symbolic and numerical computational techniques are used to solve engineering problems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ME 233. Artificial Intelligence for Design (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores the application of artificial intelligence to engineering design. Topics include the use of search, knowledge-based systems, machine learning, and qualitative physical reasoning for design automation. Addresses the theory behind these techniques and issues related to their practical application. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes.

**ME 240A. Fundamentals of Fluid Mechanics (4)**

Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to fluid mechanics. Explores equations of motion, stress tensor, the Navier-Stokes equations, boundary conditions, exact solutions, vorticity, and boundary layers.

**ME 240B. Fundamentals of Fluid Mechanics (4)**

Lecture, 4 hours. Prerequisite(s): ME 240A or consent of instructor. Covers inviscid flow, the Euler and Bernoulli equations, potential flow, and wing theory and introduces stability theory and turbulence.

**ME 241A. Fundamentals of Heat and Mass Transfer (4)**

Lecture, 4 hours. Prerequisite(s): ME 240A or consent of instructor. Introduces in-depth derivations of equations and principles governing heat and mass transfer with an emphasis on formulation of problems. Topics include equations involved in conduction, convection, radiation, energy, and species conservation and the analytical and numerical solution of transport problems. Mechanical Engineering graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**ME 241B. Transport through Porous Media (4)**

Lecture, 4 hours. Prerequisite(s): graduate standing. Covers current theories on flow, heat, and mass transfer and the mechanisms of multiphase transport in porous media. Mechanical Engineering graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**ME 241C. Electronic Cooling and Thermal Issues in Microelectronics (4)**

Lecture, 4 hours. Prerequisite(s): graduate standing. Discusses thermal issues associated with the life cycle of electronic products. Covers passive, active, and hybrid thermal management techniques, computational modeling approaches, and advanced thermal management concepts such as single phase, phase change and heat pipes. Mechanical Engineering graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**ME 242. Turbulence in Fluids (4)**

Lecture, 4 hours. Prerequisite(s): ME 240A or consent of instructor. An introduction to the application of fundamental conservation laws of mechanics (mass, momentum, and energy) to the modeling of complex turbulent natural and human-made flows. Covers tensor notation, statistical and spectral analysis, and basic turbulent closure techniques, including understanding of turbulence with intuitive insight into the problems that cannot be rigorously solved. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**ME 243. Advanced Mechanical Engineering Thermodynamics (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A or equivalent. Introduces the fundamental statistical foundations of classical thermodynamics. Explores the origins of entropy, temperature, pressure, chemical potential, and the free energies. Applications include chemical equilibrium and reactions, phase equilibrium and transitions including vapor-liquid and solid-solid, fluctuations, and thermodynamics in nanoscale systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ME 244. Nanoscale Heat Transfer and Energy Conversion (4) F**

Lecture, 4 hours. Prerequisite(s): at least two of EE 201/MSE 207, EE 202/MSE 217, ME 100A, ME 116A, or equivalents. Explores fundamental processes of energy transport and conversion at short length and time scales. Introduces classical and quantum-mechanical size effects on electrons, phonons, and photons. Topics include modes of energy storage, coupling between energy carriers, and

electrical and thermal transport using the Boltzmann transport equation and/or kinetic theory. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ME 245. Radiative Heat Transfer (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 116A or ME 116B or equivalent or consent of instructor. Offers in-depth study of topics related to radiative heat transfer. Builds upon curriculum of radiation presented at the undergraduate level. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ME 246. Computational Fluid Dynamics with Applications (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 240A or consent of instructor. Introduces finite difference, finite volume, and finite element; spectral methods, governing equations for nonreacting and reacting flows; and stability and convergence for steady and unsteady problems. Students use commercial computational fluid dynamics (CFD) software for the course project.

**ME 247. Applied Combustion and Environmental Applications (4)**

Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Topics include chemical reaction thermodynamics and kinetics of fuel-air mixtures, governing equations for reacting flows, premixed flame structure and propagation, diffusion flame analysis, ignition theory, droplet and spray combustion, pollutant formation in internal combustion engines, pollution control, principles of air pollution, and atmospheric transport.

**ME 248. Internal Combustion Engines (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A; graduate standing. Covers engine types and their operation. Also addresses engine design and operating parameters, thermochemistry of fuel-air mixture, engine cycles, spark ignition and compressed ignition engines, and emissions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ME 250. Seminar in Mechanical Engineering (1 or 2)**

Seminar, 1-2 hours. Prerequisite(s): graduate standing. Seminar in selected topics in mechanical engineering presented by graduate students, staff, faculty, and invited speakers. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**ME 261. Theory of Elasticity (4)**

Lecture, 4 hours. Prerequisite(s): ME 110 or consent of instructor. Introduction to tensors, strain, equations of motion, and constitutive equations. Topics include typical boundary value problems of classical elasticity, problems of plane strain and plane stress, and variational principles.

**ME 266. Mechanics and Physics of Materials (4)**

Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the structure and properties of materials; the characterization and modeling of mechanical, thermal, electric, and magnetic properties of materials; and coupling properties. Topics include phase transformations and brittle-to-ductile transitions. Cross-listed with MSE 208.

**ME 267. Finite Element Methods in Solid**

**Mechanics (4)** Lecture, 4 hours. Prerequisite(s): ME 261 or consent of instructor. Covers the formulation and implementation of finite element methods, including the Galerkin and energy methods. Topics include the static and dynamic analysis of mechanical and multiphysical systems and techniques of automatic mesh generation.

**ME 270. Introduction to Microelectromechanical Systems (4)**

Lecture, 4 hours. Prerequisite(s): ME 110, ME 114, or equivalents. An introduction to the design and fabrication of microelectromechanical systems (MEMS). Topics include micromachining processes; material properties; transduction; applications in mechanical, thermal, optical, radiation, and biological sensors and actuators; microfluidic devices; Bio-MEMS and applications; packaging and reliability concepts; and metrology techniques for MEMS. Cross-listed with MSE 238.

**ME 271. Therapeutic Biomedical Microdevices (4)**

Lecture, 4 hours. Prerequisite(s): ME 270/MSE 238 or equivalent or consent of instructor. An introduction to the application of micro device technology towards biomedical therapeutics. Topics include emerging micro device fabrication techniques, bio compatibility requirements, and applications in areas such as cardiovascular intervention, minimally-invasive drug delivery, neuroprosthetic interfaces, and cellular engineering. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**ME 272. Nanoscale Science and Engineering (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An overview of the machinery and science of the nanometer scale. Topics include patterning of materials via scanning probe lithography; electron beam lithography; nanoimprinting; self-assembly; mechanical, electrical, magnetic, and chemical properties of nanoparticles, nanotubes, nanowires, and biomolecules (DNA, protein); self-assembled monolayers; and nanocomposites and synthetic macromolecules. Cross-listed with MSE 248.

**ME 278. Imperfections in Solids (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or Computer Science or Electrical Engineering or Materials Science and Engineering or Mechanical Engineering. Covers fundamentals of crystal structures and crystal defects, including the generation of point defects; nucleation and propagation of dislocations; perfect and partial dislocations; twins, stacking faults, and transformations; mechanics of semiconductor and metallic thin films and multilayered structures. Cross-listed with MSE 218.

**ME 290. Directed Studies (1-6)**

Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics in mechanical engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

**ME 297. Directed Research (1-4)**

Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Research conducted under the supervision of a faculty member on selected problems in mechanical engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

**ME 298-I. Individual Internship (1-12) F, W, S, Summer**

Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): graduate standing; consent of graduate advisor. An individual apprenticeship in Mechanical Engineering with an approved professional individual or organization. Includes academic work under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**ME 299. Research for the Thesis or Dissertation (1-12)**

Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. Research in mechanical engineering for the M.S. thesis or Ph.D.

dissertation. Graded satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**ME 302. Apprentice Teaching (1-4)** Seminar, 1-4 hours. Prerequisite(s): appointment as a teaching assistant or an associate in Mechanical Engineering. Topics include effective teaching methods, such as those involved in leading discussion sections and preparing and grading examinations, and student-instructor relations in lower- and upper-division Mechanical Engineering courses. Required each quarter of teaching assistants and associates in Mechanical Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

## Media and Cultural Studies

**Subject abbreviation: MCS**

**College of Humanities, Arts, and Social Sciences**

Toby Miller, Ph.D., Chair  
Department Office, 3111 INTS  
(951) 827-3456;  
[mediaandculturalstudies.ucr.edu](http://mediaandculturalstudies.ucr.edu)

### Professor

Toby Miller, Ph.D.

### Professor Emeritus

D. Charles Whitney, Ph.D. (Creative Writing)

### Associate Professors

Derek Burrill, Ph.D.

Keith Harris, Ph.D. (English)

Timothy Labor, Ph.D. (Music)

Freya Schiwy, Ph.D.

Andrea Smith, Ph.D.

### Assistant Professors

Lan Duong, Ph.D.

Tabassum Khan, Ph.D.

Kenneth Rogers, Ph.D.

Setsu Shigematsu, Ph.D.

Wendy Weiqun Su, Ph.D.

\*\*

### Cooperating Faculty

Susan Antebi, Ph.D. (Hispanic Studies)

Alicia Arrizon, Ph.D. (Women's Studies)

Mariam Bevi Lam, Ph.D. (Comparative Literature and Foreign Languages)

Michelle Bloom, Ph.D. (Comparative Literature and Foreign Languages)

Jayna Brown, Ph.D. (Ethnic Studies)

Amalia Cabezas, Ph.D. (Women's Studies)

Feryal Cherif, Ph.D. (Political Science)

Sabine Doran, Ph.D. (Comparative Literature and Foreign Languages)

Jennifer Doyle, Ph.D. (English)

Alessandro Fornazzari, Ph.D. (Hispanic Studies)

Christine Gailey, Ph.D. (Women's Studies)

John Ganim, Ph.D. (English)

Catherine Gudis, Ph.D. (History)

George Haggerty, Ph.D. (English)

Stephanie Hammer, Ph.D. (Comparative Literature and Foreign Languages)

Steven Helfand, Ph.D. (Economics)

Erith Jaffe-Berg, Ph.D. (Theatre)

Martin Johnson, Ph.D. (Political Science)

Jodi Kim, Ph.D. (Ethnic Studies)

John Namjun Kim, Ph.D. (Comparative Literature and Foreign Languages)

Katherine Kinney, Ph.D. (English)

Margherita Long, Ph.D. (Comparative Literature and Foreign Languages)

Tiffany Lopez, Ph.D. (Theatre)

Rene Lysloff, Ph.D. (Music)

Patricia Morton, Ph.D. (Art History)

Vorris Nunley, Ph.D. (English)

Marina Pianca, Ph.D. (Spanish/Portuguese)

Michelle Raheja, Ph.D. (English)

Rebekah Richert, Ph.D. (Psychology)

Dylan Rodriguez, Ph.D. (Ethnic Studies)

Robin Russin, Ph.D. (Theatre)

Christina Schwenkel, Ph.D. (Anthropology)

Theda Shapiro, Ph.D. (Comparative Literature and Foreign Languages)

Maurya Simon, Ph.D. (Creative Writing)

Priya Srinivasan, Ph.D. (Dance)

Erika Suderburg, Ph.D. (Art)

James Tobias, Ph.D. (English)

Carole-Anne Tyler, Ph.D. (English)

Marguerite Waller, Ph.D. (Comparative Literature and Foreign Languages/Women's Studies)

Jane Ward, Ph.D. (Women's Studies)

Devra Weber, Ph.D. (History)

Raymond Williams, Ph.D. (Hispanic Studies)

Andrew Winer, M.F.A. (Creative Writing)

Deborah Wong, Ph.D. (Music)

Victor Zordan, Ph.D. (Computer Science and Engineering)

Stephen E. Cullenberg, Ph.D.

*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

## Major

The Department of Media and Cultural Studies offers the B.A. in Media and Cultural Studies, an interdisciplinary examination of film, video, television, multimedia, and visual culture with a primary emphasis on history and theory and a secondary focus on production. The major consists of three curricular tracks, in one of which students may concentrate:

1. Film and Visual Media
2. Film, Literature, and Culture
3. Ethnography, Documentary, and Visual Culture

The Media and Cultural Studies major combines the breadth of an interdisciplinary major with a precise focus on visual media. Its interdisciplinary structure brings together approaches to visual media that would usually be separated by discipline. Students have a unique opportunity to acquire critical skills in the reading and analysis of media texts together with those involved in various modes of media production. This applied experience includes training in creative, documentary, and ethnographic video; photography; multimedia production; and screenwriting. Familiarity with media, either for its academic or industrial applications, enhances one's understanding of any field in the humanities or social sciences today.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The B.A. in Media and Cultural Studies involves three possible tracks of courses, each with different emphases in curriculum. The requirements are as follows:

For all three tracks:

Lower-division units: 16 units

Upper-division units: 40 units

### Track 1: Film and Visual Media

This track gives the student comprehensive coverage in film and media studies, covering history, theory, non-Hollywood cinema and media forms, and production. Undergraduate studies prepare the student for graduate work in film studies, cultural studies with an emphasis on visual media, or in film production.

1. Lower-division requirements (4 lower-division courses [at least 16 units]):

a) Introduction to Film Studies: MCS 020

b) Media Production: 1 course chosen from ART 003, ART 007, ART 028/THEA 038, ART 070 (E-Z), CRWT 040, CS 008, CS 010, DNCE 014, MCS 004/ART 004, MCS 066/CRWT 066/THEA 066, THEA 010

c) Two additional courses chosen from 1.b) above or from the following: AHS 008, AST 048/CHN 048, ENGL 021/THEA 021, ENGL 033, MCS 006/ART 006, MCS 009/MUS 007, MCS 015, MCS 021/CPLT 021, MCS 022/AST 022/JPN 022, MCS 023/AHS 020, MCS 024/CPLT 024, MCS 026/CPLT 026/EUR 026, MCS 036/CPLT 027, MCS 038/CLA 045, MCS 042/GER 045, MCS 043/RUSN 045, MCS 044/ITAL 045, MCS 045/FREN 045, MCS 046/SPN 046, MCS 049/AST 064/VNM 064

2. Upper-division requirements (10 upper-division courses [at least 40 units]):

a) Film, Photography, and Media History (2 courses) chosen from AHS 176, AHS 181, AHS 182, HIST 191X, MCS 110 (E-Z), MCS 114/CPLT 134/GER 134/JPN 134, MCS 115/CPLT 115/GER 163/HISE 163, MCS 137/AHS 136, MCS 138/AHS 137, MCS 145E/ENGL 145E, MCS 145-I/ENGL 145-I, MCS 170/CPLT 135/GER 135, MCS 173 (E-Z)/CPLT 173 (E-Z), MCS 186/AHS 186

b) Non-Hollywood Cinema and Alternative Media (3 courses) chosen from AST 167/MCS 167, MCS 103/ANTH 103, MCS 118 (E-Z)/GER 118(E-Z), MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 125 (E-Z)/LNST 125 (E-Z)/SPN 125 (E-Z), MSC 126/CPLT 126/GER 126, MCS 135/ART 135, MCS 136/ART 136, MCS 142/WMST 122, MCS 144K/ENGL 144K, MCS 146E/ENGL 146E, MCS 146F/ENGL 146F, MCS 146G/ENGL 146G, MCS 151M/DNCE 171M, MCS 152K/DNCE 172K, MCS 168/AST 186, MCS 169/AST 185/CHN 185, MCS 170, CPLT 135/GER 135, MCS 171/SPN 171, MCS 173 (E-

Z)/CPLT 173 (E-Z), MCS 178/EUR 110B/AHS 120/CPLT 110B/GER 110B, MCS 182/AHS 121/CPLT 138/EUR 138/GER 138, MCS 183 (E-Z)/FREN 185 (E-Z), MCS 184/AST 184/JPN 184, MCS 185/LNST 105/SPN 185

c) Media Production (1 course) chosen from ART 140, ART 142, ART 145, ART 146 (E-Z), ART 155, ART 167, ART 168, ART 169 (E-Z), ART 170, ART 175, CS 133, CS 143/EE 143, MCS 131/ART 131, MCS 150/ART 150, MCS 161/DNCE 161, MCS 162/DNCE 162, MCS 166B/CRWT 166B/THEA 166B, MCS 166C/CRWT 166C/THEA 166C, MUS 139, MUS 145, MUS 173, THEA 101, THEA 102, THEA 109, THEA 132, THEA 135, THEA 141, THEA 144, THEA 166A

d) Film and Media Theory (4 courses) chosen from AHS 187, ART 160, MCS 103/ANTH 103, MCS 104/ENGL 104 or MCS 151J/DNCE 171J, MCS 120, MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 126/CPLT 126/GER 126, MCS 133/SOC 138, MCS 139/SOC 139, MCS 142/WMST 122, MCS 143 (E-Z)/ENGL 143 (E-Z)/LGBS 143 (E-Z), MCS 144 (E-Z)/ENGL 144 (E-Z), MCS 145F/ENGL 145F, MCS 145G/ENGL 145G, MCS 145J/ENGL 145J, MCS 146 (E-Z)/ENGL 146 (E-Z), MCS 151F/DNCE 171F, MCS 151G/DNCE 171G, MCS 151K/DNCE 171K, MCS 152J/DNCE 172J, MCS 152M/DNCE 172M, MCS 153J/DNCE 173J, MCS 153K/DNCE 173K, MCS 172, MCS 174 (E-Z)/CPLT 174 (E-Z), MCS 179/LNST 109/SPN 179/WMST 179, MCS 181/CPLT 181/FREN 181, MCS 186/AHS 186

### Track 2: Film, Literature, and Culture

While this track also offers a disciplinary foundation in film and visual media studies, its focus is on the interrelations among film and visual media, literature, and culture in international cinemas and literatures. The methodologies stressed here are less formally and more thematically and/or culturally based.

1. Lower-division requirements (4 lower-division courses [at least 16 units])

a) Introduction to Film Studies: MCS 020

b) Comparative Film, Media, and Literature Studies (1 course), chosen from CRWT 040, ENGL 021/THEA 021, ENGL 033, HASS 022B, HASS 022C, MCS 021/CPLT 021, MCS 036/CPLT 027, MCS 038/CLA 045

c) Non-Hollywood Cinema and Alternative Media (1 course) chosen from AST 048/CHN 048, MCS 015, MCS 022/AST 022/JPN 022, MCS 024/CPLT 024, MCS 026/CPLT 026/EUR 026, MCS 042/GER 045, MCS 043/RUSN 045, MCS 044/ITAL 045, MCS 045/FREN 045, MCS 046/SPN 046, MCS 049/AST 064/VNM 064

d) Additional 1 course chosen from 1.b) or c) above, or from the following Media Production courses:

AHS 008, ART 003, ART 007, ART 070 (E-Z), CS 008, CS 010, DNCE 014, MCS 004/ART 004, MCS 006/ART 006, MCS 009/MUS 007, MCS 023/AHS 020, ART 028/THEA 038, MCS 066/CRWT 066 THEA 066, THEA 010

2. Upper-division requirements (10 upper-division courses [at least 40 units])

a) Film, Photography and Media History

(2 courses) chosen from AHS 176, AHS 181, AHS 182, HIST 191X, MCS 110 (E-Z), MCS 114/CPLT 134/GER 134/JPN 134, MCS 115/CPLT 115/GER 163/HISE 163, MCS 137/AHS 136, MCS 138/AHS 137, MCS 145E/ENGL 145E, MCS 145-I/ENGL 145-I, MCS 170/CPLT 135/GER 135, MCS 173 (E-Z)/CPLT 173 (E-Z), MCS 186/AHS 186

b) Non-Hollywood Cinema and Alternative Media (2 courses) chosen from

MCS 103/ANTH 103, MCS 118 (E-Z)/GER 118 (E-Z), MCS 121F/CPLT 171F, MCS 125 (E-Z)/LNST 125 (E-Z)/SPN 125 (E-Z), MCS 126/CPLT 126/GER 126, MCS 135/ART 135, MCS 136/ART 136, MCS 142/WMST 122, MCS 144K/ENGL 144K, MCS 146E/ENGL 146E, MCS 146F/ENGL 146F, MCS 146G/ENGL 146G, MCS 167/AST 167, MCS 168/AST 186, MCS 169/AST 185/CHN 185, MCS 170/CPLT 135/GER 135, MCS 151M/DNCE 171M, MCS 152K/DNCE 172K, MCS 171/SPN 171, MCS 173 (E-Z)/CPLT 173 (E-Z), MCS 178/EUR 110B/AHS 120/CPLT 110B/GER 110B, MCS 182/GER 138/AHS 121/CPLT 138/EUR 138, MCS 183 (E-Z)/FREN 185 (E-Z), MCS 184/AST 184/JPN 184

c) Film and Media Theory (2 courses) chosen from

AHS 187, ART 160, MCS 103/ANTH 103, MCS 120, MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 126/CPLT 126/GER 126, MCS 133/SOC 138, MCS 139/SOC 139, MCS 142/WMST 122, MCS 143 (E-Z)/ENGL 143 (E-Z)/LGBS 143 (E-Z), MCS 144 (E-Z)/ENGL 144 (E-Z), MCS 145 (E-Z)/ENGL 145 (E-Z), MCS 146 (E-Z)/ENGL 146 (E-Z), MCS 151F/DNCE 171F, MCS 151G/DNCE 171G, MCS 151J/DNCE 171J or MCS 104/ENGL 104, MCS 151K/DNCE 171K, MCS 152J/DNCE 172J, MCS 152M/DNCE 172M, MCS 153J/DNCE 173J, MCS 153K/DNCE 173K, MCS 172, MCS 179/LNST109/SPN 179/WMST 179, MCS 186/AHS 186

d) Studies in Film, Literature, and Culture (4 courses):

(1) Literature and Visual Culture (at least 1 but not more than 3 courses) chosen from CPLT 143/FREN 143,

CPLT 180V, ETST 170/WRLT 170, ETST 175/WMST 175, MCS 103/ANTH 103, MCS 126/CPLT 126/GER 126, MCS 142/WMST 122, MCS 143 (E-Z)/ENGL 143 (E-Z)/LGBS 143 (E-Z), MCS 144 (E-Z)/ENGL 144 (E-Z), MCS 172, MCS 174 (E-Z)/CPLT 174 (E-Z), MCS 178/EUR 110B/AHS 120/CPLT 110B/GER 110B, MCS 181/CPLT 181/FREN 181, PHIL 111

(2) Cultural Studies (at least 1 but not more than 2 courses) chosen from AHS 134/HISE 134, AHS 166/WMST 169, ANTH 128/AST 128/DNCE 128/MUS 128/THEA 176, ANTH 163, ANTH 168/ETST 148/LNST 168, ANTH 177/MUS 126/WMST 126, ENGL 142 (E-Z), EUR 111C, EUR 112C, EUR 115F, EUR 116, EUR 119 (E-Z), MCS 179/LNST 109/SPN 179/WMST 179, MCS 182/AHS 121/CPLT 138/EUR 138/GER 138, MCS 185/LNST 105/SPN 185, POSC 146, SPN 102A, SPN 102B

(3) Media Production (no required units but 1 course may be taken) chosen from ART 140, ART 142, ART 145, ART 146 (E-Z), ART 155, ART 167, ART 168, ART 169 (E-Z), ART 170, ART 175, CS 133, CS 143/EE 143, MCS 131/ART 131, MCS 150/ART 150, MCS 161/DNCE 161, MCS 162/DNCE 162, MCS 166B/CRWT 166B/THEA 166B, MCS 166C/CRWT 166C/THEA 166C, MUS 139, MUS 145, MUS 173, THEA 101, THEA 102, THEA 109, THEA 132, THEA 135, THEA 141, THEA 144, THEA 166A

(4) Literary and Cultural Theory (no required units but up to 1 course may be taken) chosen from CPLT 110 or ENGL 101

### Track 3: Ethnography, Documentary, and Visual Culture

This cluster provides a basic knowledge of film and visual media studies as well as in-depth coverage of the theories and methods that guide production of ethnographic and documentary films, and visual media. Students receive both critical and applied training in ethnographic methods and ethnographic and documentary film and video practices.

1. Lower-division requirements (4 lower-division courses [at least 16 units]):

a) Introduction to Film Studies: MCS 020

b) Media Production (1 course) chosen from ART 003, ART 007, ART 028/THEA 038, ART 070 (E-Z), CRWT 040, CS 008, CS 010, DNCE 014, MCS 004/ART 004, MCS 066/CRWT 066/THEA 066, THEA 010

c) Cultural Anthropology (1 course) chosen from ANTH 001, ANTH 001H

- d) One (1) additional course chosen from 1.b) above or from AHS 007, AHS 008, AST 048/CHN 048, ENGL 033, HASS 022B, HASS 022C, MCS 006/ART 006, MCS 009/MUS 007, MCS 015, MCS 021/CPLT 021, MCS 022/AST 022/JPN 022, MCS 023/AHS 020, MCS 024/CPLT 024, ENGL 021/THEA 021, MCS 026/CPLT 026/EUR 026, MCS 036/CPLT 027, MCS 038/CLA 045, MCS 042/GER 045, MCS 043/RUSN 045, MCS 044/ITAL 045, MCS 045/FREN 045, MCS 046/SPN 046, MCS 049/AST 064/VNM 064, MUS 006/ANTH 006, SOC 001, WMST 010
2. Upper-division requirements (10 upper-division courses [at least 40 units]):
- a) Film, Photography, and Media History (2 courses) chosen from AHS 176, AHS 181, AHS 182, HIST 191X, MCS 110 (E-Z), MCS 114/CPLT 134/GER 134/JPN 134, MCS 115/CPLT 115/GER 163/HISE 163, MCS 137/AHS 136, MCS 138/AHS 137, MCS 145E/ENGL 145E, MCS 145-I/ENGL 145-I, MCS 170/CPLT 135/GER 135, MCS 173 (E-Z)/CPLT 173 (E-Z), MCS 186/AHS 186
- b) Non-Hollywood Cinema and Alternative Media (3 courses) chosen from MCS 103/ANTH 103, MCS 118 (E-Z)/GER 118 (E-Z), MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 125 (E-Z)/LNST 125 (E-Z)/SPN 125 (E-Z), MCS 126/CPLT 126/GER 126, MCS 135/ART 135, MCS 136/ART 136, MCS 142/WMST 122, MCS 144K/ENGL 144K, MCS 146E/ENGL 146E, MCS 146F/ENGL 146F, MCS 146G/ENGL 146G, MCS 167/AST 167, MCS 151M/DNCE 171M, MCS 152K/DNCE 172K, MCS 168/AST 186, MCS 169/AST 185/CHN 185, MCS 170/CPL 135/GER 135, MCS 171/SPN 171, MCS 173 (E-Z)/CPLT 173 (E-Z), MCS 178/AHS 120/CPLT 110B/EUR 110B/GER 110B, MCS 182/AHS 121/CPLT 138/EUR 138/GER 138, MCS 183 (E-Z)/FREN 185 (E-Z), MCS 184/AST 184/JPN 184, MCS 185/LNST 105/SPN 185
- c) Film and Media Theory (1 course) chosen from AHS 187, ART 160, MCS 103/ANTH 103, MCS 104/ENGL 104 or MCS 151J/DNCE 171J, MCS 120, MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 126/CPLT 126/GER 126, MCS 133/SOC 138, MCS 139/SOC 139, MCS 142/WMST 122, MCS 143 (E-Z)/ENGL 143 (E-Z)/LGBS 143 (E-Z), MCS 144 (E-Z)/ENGL 144 (E-Z), MCS 145F/ENGL 145F, MCS 145G/ENGL 145G, MCS 145J/ENGL 145J, MCS 146 (E-Z)/ENGL 146 (E-Z), MCS 151F/DNCE 171F, MCS 151G/DNCE 171G, MCS 151K/DNCE 171K, MCS 152J/DNCE 172J, MCS 152M/DNCE 172M, MCS 153J/DNCE 173J, MCS 153K/DNCE 173K, MCS 172, MCS 174 (E-Z)/CPLT 174 (E-Z), MCS 179/LNST 109/SPN 179/WMST 179, MCS 181/CPLT 181/FREN 181, MCS 186/AHS 186
- d) Ethnography and Documentary: Production, Theories, and Texts (4 courses)
- (1) Production (at least 2 courses) chosen from ART 140, ART 142, ART 145, ART 146 (E-Z), ART 155, ART 167, ART 168, ART 169 (E-Z), ART 170, ART 175, CS 133, CS 143/EE 143, MCS 131/ART 131, MCS 150/ART 150, MCS 161/DNCE 161, MCS 162/DNCE 162, MCS 166B/CRWT 166B/THEA 166B, MCS 166C/CRWT 166C, MUS 139, MUS 145, MUS 173, THEA 101, THEA 102, THEA 109, THEA 132, THEA 135, THEA 141, THEA 144, THEA 166A, THEA 166C
- (2) Theories and Texts (at least 2 courses) chosen from AHS 115/LNST 115, AHS 134/HISE 134, AHS 166/WMST 169, AHS 182, AHS 187, ANTH 102/AHS 102, ANTH 121, ANTH 128/AST 128/DNCE 128/MUS 128/THEA 176, ANTH 137, ANTH 163, ANTH 176/AST 127/ DNCE 127/ETST 172/MUS 127, ANTH 177/MUS 126/WMST 126, ANTH 180A, ANTH 180B, ART 160, CPLT 110, CPLT 143/FREN 143, DNCE 130/ANTH 130, DNCE 173K, ENGL 101, ENGL 121 (E-Z), ENGL 122 (E-Z)/LGBS 122 (E-Z), ENGL 123B, ENGL 124A, ETST 153/LNST 153, ETST 170/WRLT 170, ETST 175/WMST 175, MCS 103/ANTH 103, MCS 104/ENGL 104, MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 126/CPLT 126/GER 126, MCS 142/WMST 122, MCS 143 (E-Z)/ENGL 143 (E-Z)/LGBS 143 (E-Z), MCS 144 (E-Z)/ENGL 144 (E-Z), MCS 145-I/ENGL 145-I, MCS 146 (E-Z)/ENGL 146 (E-Z), MCS 151F/DNCE 171F, MCS 151G/DNCE 171G, MSC 151J/DNCE 171J or MCS 151K/DNCE 172K, MCS 172, MCS 174 (E-Z)/CPLT 174 (E-Z), MCS 181/CPLT 181/FREN 181, POSC 146, SOC 168, SOC 169
- The following may be taken as a part of any track to meet individual needs: MCS 190, MCS 198-I.
- Minor**
- The Media and Cultural Studies minor provides an interdisciplinary examination of film, television, digital multimedia, and visual culture, with an emphasis on history and theory, rather than production, in order to develop media literacy.
- A minimum of 24 units (one lower-division course and five upper-division courses) are required. No course can be used to satisfy more than one requirement.
1. Lower-division requirements (1 course [at least 4 units]) chosen from the following:
- ENGL 033, MCS 004/ART 004, MCS 015, MCS 020, MCS 021/CPLT 021
2. Upper-division requirements (a minimum of 5 courses [at least 20 units])
- a) One course from each of the following three groups:
- (1) Film, Photography, and Media History: AHS 176, AHS 182, HIST 191X, MCS 110 (E-Z), MCS 114/CPLT 134/GER 134/JPN 134, MCS 115/CPLT 115/GER 134/JPN 134, MCS 137/AHS 136, MCS 138/AHS 137, MCS 145E/ENGL 145E, MCS 145-I/ENGL 145-I, MCS 170/CPLT 135/GER 135, MCS 173 (E-Z)/CPLT 173 (E-Z), MCS 174 (E-Z)/CPLT 174 (E-Z), MCS 186/AHS 186
- (2) Non-Hollywood Cinema and Alternative Media: MCS 118 (E-Z)/GER 118 (E-Z), MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 125 (E-Z)/LNST 125 (E-Z)/SPN 125 (E-Z), MCS 126/CPLT 126/GER 126, MCS 135/ART 135, MCS 136/ART 136, MCS 142/WMST 122, MCS 144K/ENGL 144K, MCS 146E/ENGL 146E, MCS 146F/ENGL 146F, MCS 146G/ENGL 146G, MCS 151M/DNCE 171M, MCS 152K/DNCE 172K, MCS 167/AST 167, MCS 168/AST 168, MSC 169/AST 185/CHN 185, MCS 170/CPLT 135/GER 135, MCS 171/SPN 171, MCS 173 (E-Z)/CPLT 173 (E-Z), MCS 178/AHS 120/CPLT 110B/EUR 110B/GER 110B, MCS 179/LNST 109/SPN 179/WMST 179, MCS 182/AHS 121/CPLT 138/EUR 138/GER 138, MCS 183 (E-Z)/FREN 185 (E-Z), MCS 184/AST 184/JPN 184, MCS 185/LNST 105/SPN 185
- (3) Film and Media Theory: MCS 104/ENGL 104 or MCS 151J/DNCE 171J, MCS 118 (E-Z)/GER 118 (E-Z), MCS 121 (E-Z)/CPLT 171 (E-Z), MCS 126/CPLT 126/GER 126, MCS 142/WMST 122, MCS 143 (E-Z)/ENGL 143 (E-Z)/LGBS 143 (E-Z), MCS 144 (E-Z)/ENGL 144 (E-Z), MCS 145F/ENGL 145F, MCS 145G/ENGL 145G, MCS 145J/ENGL 145J, MCS 146 (E-Z)/ENGL 146 (E-Z), MCS 151F/DNCE 171F, MCS 151G/DNCE 171G, MCS 151K/DNCE 171K, MCS 152J/DNCE 172J, MCS 152M/DNCE 172M, MCS 153J/DNCE 173J, MCS 153K/DNCE 173K, MCS 172, MCS 181/CPLT 181/FREN 181
- b) Two (2) additional courses chosen from 2.a(1),(2), and (3) above or from AHS 181, ART 140, ART 142, ART 145, ART 146 (E-Z), ART 155, ART 167, ART 168, ART 169 (E-Z) (4 units), ART 170, ART 175, CS 133, CS 143/EE 143, MCS 103/ANTH 103, MCS 131/ART 131,

MCS 133/SOC 138, MCS 139/SOC 139, MCS 150/ART 150, MCS 161/DNCE 161, MCS 162/DNCE 162, MCS 166B/CRWT 166B/THEA 166B, MCS 166C/CRWT 166C/THEA 166C, MCS 174 (E-Z)/CPLT 174(E-Z), MUS 139, MUS 145, MUS 173, THEA 101, THEA 102, THEA 109, THEA 132, THEA 135, THEA 141, THEA 144, THEA 166A

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Lower-Division Courses

**MCS 001. Introduction to Media and Cultural Studies (4)** Lecture, 3 hours; discussion, 1 hour. Examines media from economic, political, and cultural perspectives. Discusses their relation to U.S. export industries; democratic communication and the parliamentary process; and social trends. Explores how changes in media and associated technologies are akin to a new industrial revolution. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**MCS 004. Introduction to Moving Images: Film, Video and New Media (5)** Lecture, 3 hours; studio, 3 hours; screening, 3 hours. Prerequisite(s): none. Explores issues and skills of video/film/media art based in production, history, and theory of the moving image. Introduces basic production, editing concepts and techniques of live-action production, story boards, image editing, and final authoring. Examines the moving image through installation, documentary, experimental film, video art, sound art, and performance. Cross-listed with ART 004. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 005. Introduction to Media Studies (4)** Lecture, 3 hours; discussion, 1 hour. Introduces the history of various mass media industries. Analyzes the roles, functions, and effects of mass communication. Discusses recent technological developments and their implications for communication studies, as well as media law, policy, and ethics. Investigates the diffusion and impact of U.S. mass media in an era of heightened globalization. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 006. Introduction to Contemporary Critical Issues in Art (4)** Lecture, 3 hours; discussion, 1 hour. Examines basic principles and methodologies of theory as applied to the interpretation and creation of works of art. Includes screenings. Cross-listed with ART 006. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 009. Music in Movies and TV (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An exploration of popular film and TV soundtrack music, emphasizing drama and musical style. Scene study features such films as *The Matrix*, *Casablanca*, *The X-Files*, and *Altered States*. Cross-listed with MUS 007. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 010. Introduction to Cultural Studies (4)** Lecture, 3 hours; discussion, 1 hour. Investigates culture through the frameworks of feminism, Marxism, and race theories. Analyzes the different methodologies

cultural critics use to theorize subcultures, cultural policies, and consumption. Explores ways cultural works are not only produced and received but also distributed and circulated within national and transnational contexts. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 015. Introduction to Television Studies (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the study of television, including its stylistic conventions, primary genres, modes of production, economics, and important critical methodologies. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 020. Introduction to Film Studies (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the formal and narrative principles of film construction and to various critical approaches to the cinema, such as auteur and genre theory. Provides an overview of world cinemas. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 021. Introduction to Film, Literature, and Culture (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Surveys critical approaches to the cinema such as auteur and genre theory. Studies literature and film, national cinemas, and film movements. Cross-listed with CPLT 021. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 022. Introduction to Japanese Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to Japan's major directors and to watching and writing about Japanese film. Works studied range from the samurai epics of Kurosawa to recent anime. All films have subtitles. No previous knowledge of Japanese language or culture is required. Cross-listed with AST 022 and JPN 022. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 023. Introduction to Media Art (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the impact of media technology on the visual arts, from photography to the Internet. Addresses mechanical reproduction, perception, gender, sexuality, identity, interactivity, cybernetics, and popular culture. Cross-listed with AHS 020. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 024. World Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduction to world cinema as a fusion of national and international, culturally specific, and globally universal characteristics. Topics include realism, the role of world wars, Hollywood's global reach, alternative aesthetics of third-world cinemas, cross-fertilization between Europe and Asia, and the function of international film festivals and the international film market. Cross-listed with CPLT 024. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 026. New European Cinemas: Experiment and Innovation (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to a succession of New Waves in European Cinema: *Neorealism* in Italy, *New Wave* in France, and *New Cinema* in Germany, Russia, and Britain. Study of political engagements and technical innovations. Topics include the concept of the auteur, key manifestos, and attempts to define European cinema in film theory. Cross-listed with CPLT 026 and EUR 026. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 036. Food in Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Explores the representation of food, cooking, and restaurants in films from different national traditions. Includes gender roles; sensuality and sexuality; social class and the economics of food; excess and lack. Cross-listed with CPLT 027. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**MCS 038. The Ancient World in Film and Television (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of representations of Greece and Rome in film, television, and other modern media. Introduces these 'visual texts' both as popular art forms on their own and in relation to their ancient and modern literary sources. Cross-listed with CLA 045. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 042. Introduction to German Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduction to the history of German cinema from the advent of the studio system to the present. Covers film in Germany, Switzerland, and Austria. Attention is paid to the work of German-speaking filmmakers living in other parts of the world. Instruction is in English; all films have subtitles. Cross-listed with GER 045. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 043. Soviet Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A survey of the Soviet cinema, beginning with the film innovations of the 1920s and continuing with representative films from each of the ensuing periods of Soviet culture. All work done in English. Cross-listed with RUSN 045. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 044. Italian Cinema (4)** Lecture, 1.5 hours; discussion, 1.5 hours; screening, 3 hours. Prerequisite(s): none. Covers major works of the Italian cinema from Neo-Realism to the present, with emphasis on their historical evolution and representation of major elements of Italian culture. Knowledge of Italian not required. Cross-listed with ITAL 045. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 045. French Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Covers masterpieces of French cinema. Examines the historical evolution of French cinema as an art form, with emphasis on major themes and directors. Cross-listed with FREN 045. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 046. Introduction to Latin American Film (5)** Lecture, 3 hours; screening, 3 hours; discussion, 1 hour. Provides an historical overview of Latin American film production. Introduces students to film industries, revolutionary cinema, the role of television, and recent international co-productions. Cross-listed with SPN 046. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 047. Introduction to Korean Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the major directors and films of Korea. Covers the genres and periods of works produced from the 1960s to the present. All films have English subtitles. No previous knowledge of Korean language or culture required. Cross-listed with AST 047 and KOR 047. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 049. Introduction to Vietnamese and Diasporic Film Culture (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Engages students in critical

viewing strategies and analytical visual critique. Explores the revival of film production in Vietnam following the Vietnam War, with a focus on the means of production, state control, and international distribution. Readings are in translation; classes are conducted in English. Cross-listed with AST 064 and VNM 064. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 066. Screenwriting: How Movies Work (4)**

Lecture, 3 hours; discussion, 1 hour; screening, 8 hours per quarter. Prerequisite(s): none. An Introduction to writing for stage and screen. Addresses structure, character, dialogue, theme, and story. Cross-listed with CRWT 066 and THEA 066. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

## Upper-Division Courses

**MCS 103. Introduction to Visual Anthropology (4)**

Seminar, 3 hours; outside research and projects, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. An introduction to the field of visual anthropology. Examines the similarities and differences between ethnographic film, critical studies, and written ethnographies. Explores the politics of representing other cultures visually. Cross-listed with ANTH 103. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 104. Film and Media Theory (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers different types of film and media theory. Addresses formalist, psychoanalytic, Marxist, feminist, and other approaches to the cinema and/or other media. Cross-listed with ENGL 104. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 110 (E-Z). Topics in Film and Media History (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers topics in the history of film and media with attention to their aesthetic, socio-political, and economic contexts. E. Film and Media History through World War II; J. Film and Media History after World War II. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 111. History of Media Theory (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper division standing or consent from instructor. Provides a historical trajectory of theories of evolving media effects. Explores methods that serve as reference points for mass communication research. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**MCS 114. Cinematic War Memory (4)**

Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines cinematic confrontations involving World War II in Germany and Japan. Topics include desire between victims and perpetrators, representation of trauma, and ethical responsibility. All screenings have English subtitles. Cross-listed with CPLT 134, GER 134, and JPN 134. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 115. Modern German History through Film (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores twentieth-century German history through film. Includes World Wars I and II, inflation and polarization of classes, Nazi Germany, representations of

the Holocaust, and a divided and reunited Germany. Cross-listed with CPLT 115, GER 163, and HISE 163. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 118 (E-Z). Topics in German Cinema (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of selected films, directors, and movements in German film. Films are in German with English subtitles. No knowledge of German is required. Cross-listed with GER 118 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 120. Major Figures in Film and Media (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive analysis of the work of a significant figure in film, television, or other media who functions as an "auteur" (e.g. an influential director, star, or producer). Course is repeatable as topics change to a maximum of 8 units. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 121 (E-Z). Auteurs and Auteur Theory (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical studies on a director or group of directors that deal with a substantial portion of their works. F. Fassbinder; I. Fellini; T. Truffaut. Cross-listed with CPLT 171 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 123. Asian American Women: Writing the Self in Literature and Film (4)**

Lecture, 3 hours; screening, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analyzes Asian American autobiographies and films written and directed by women. Explores why the genre of autobiography is enabling and contentious within Asian American women's writings. Examines films to see how such women filmmakers contend with memory, gender, and identity. Cross-listed with WMST 124. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 124. Latin America, Democracy, and the Media (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the construct of democracy in Latin America related to various media. Introduces current political and cultural issues in multiple countries. Critically reflects on the concept of democracy and how different social actors understand democracy. Evaluates the role of media in democratic processes. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 125 (E-Z). Topics in Latin American Film and Media (5)**

Lecture, 3 hours; screening, 3 hours; extra reading, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of a theme or issue in Latin American film and media. E. Indigenous Video and Latin America. Cross-listed with LNST 125 (E-Z) and SPN 125 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 126. From Novel to Screen: Film Adaptations of German Literature (4)**

Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to classic works of German literature and their film adaptations. Explores adaptations by film directors such as Welles, Kubrick, Visconti, and Fassbinder. Studies the nexus between literature, film,

and theatre. Course conducted in English. Cross-listed with CPLT 126 and GER 126. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 127. Chicana/o Cultural Studies and Gender Politics (4)**

Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the field of Chicana/o cultural studies and investigates the gender politics that attest to its intersectional approach. Considers how power and gendered politics have impacted the restructuring of the split subject in Chicana/o cultural studies. Cross-listed with WMST 166. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 128. Queer of Color Cultural Critique (4)**

Seminar, 3 hours; project, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores emerging themes in queer of color critique. Includes modes of analysis, subjects, political prioritization, and paradigm shifts. Examines theory and seeks to locate theorizing in multiple sites and forms to encourage and imagine real world applications for cultural critique (including its translation to and from arenas of social justice). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 131. Intermediate Photography and Digital Technology (4)**

Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ART 003 or consent of instructor. Covers the complete cycle of photographic production from scanning to output. Emphasizes developing skill in creating digital photographic imagery for creative and cultural expression. Software and some digital equipment are provided. A 35mm single lens reflex (SLR) or digital cameras and flash drives are required. Course is repeatable to a maximum of 8 units. Cross-listed with ART 131. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 132. Intersections of Media and Popular Culture (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper division standing or consent from instructor. Examines the interconnections of media technologies, modes of audience engagement, and the political and economic contexts of audience formation. Focuses on production sites and distribution and consumption of media. Explores how theoretical frameworks converge in the examination of connections between cultural texts and social contexts and between media and society. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**MCS 133. The Effects of Mass Media (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. A sociological approach to "media effects" including the history of effects research, theories, loci of effects studies, and social policy. Cross-listed with SOC 138. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 134. Transmedia: Demonstration Project (4)**

Lecture, 2 hours; workshop, 1 hour; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces strategies for organizing and presenting materials, ideas, and arguments in various media. Includes visual, written, and audio texts; the spoken word; and performance. Course is repeatable to a maximum of 8 units. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 135. Intermedia: Art, Media, and Culture (4)**

Lecture, 2 hours; screening, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of performance, photography, video, film, television, installation, and other related "intermedias." Focuses on artworks within and without the mass media: how they are constructed, documented, analyzed, and viewed in the larger context of culture. Cross-listed with ART 135. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 136. Installation and Site-Specific Art (4)**

Lecture, 3 hours; studio, 3 hours. Prerequisite(s): consent of instructor. Focuses on performance, photo installation, computer art, video/film, site-specific installation, sculpture, and/or other intermedia. Concentrates on production and analysis of site-specific art. Course is repeatable to a maximum of 8 units. Cross-listed with ART 136. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 137. History of Video Art (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Traces the evolution of video art from the invention of the Portapak and early video collectives to the current ubiquity of video installation, single-channel, and multimedia art. Emphasis is on video art in the United States. Cross-listed with AHS 136. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 138. History of Experimental Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. A survey of cinema outside of the economic, institutional, and aesthetic imperatives of mainstream film production. Covers an array of alternative film movements, including surrealism and dada, Soviet avant-garde, the Cine 16 Group, French new wave, North American avant-garde, and the artist's film. Cross-listed with AHS 137. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 139. Mass Media and Popular Culture (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. A comparative analysis of the television, radio, record, cinema, and journalism industries as social institutions and a discussion of contemporary developments in mass communications theory. A study of the relationship between the social processes of modern society and the content of popular culture. Cross-listed with SOC 139. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 140. Alternative Media Production and Social Movements (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the history, theory, and practice of alternative forms of media production. Focuses on how various media forms were used to disseminate information in order to motivate audiences to take action for social change. Provides opportunities to learn documentary making, experiment with media forms, and produce alternative media projects. Course is repeatable as topics change to a maximum of 12 units. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 142. Gender in Southeast Asian Diasporic Literature and Film (5)**

Lecture, 3 hours; screening, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Looks at former Indochinese refugees who are producing literature and films in the United States and France. Examines how "Indochina" has been

constructed, and in particular, has been gendered female in the colonial imaginary. Explores how Southeast Asian immigrants are returning to the Western gaze. Cross-listed with WMST 122. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**MCS 143 (E-Z). Gender, Sexuality, and Visual Cultures (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of gender and sexuality in film, television, and visual culture. E. Feminist Film Theory and Practice; F. Film and Gender; G. Screening the Lesbian; K. Queers that Kill. Cross-listed with ENGL 143 (E-Z) and LGBS 143 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 144 (E-Z). Race, Ethnicity, and Visual Culture (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of race and ethnicity in film, television, and visual culture. Weekly screenings and readings. I. Racial Difference and Visual Culture in the Postcolonial World Context; J. Film, Race, and Ideology: The Case of the Vietnam War; K. Decolonizing the Screen. Cross-listed with ENGL 144 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 145 (E-Z). Special Topics in Film and Visual Culture (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An intensive formal, historical, and theoretical analysis of a theme or issue in film, media, television, and visual culture. E. Hollywood in the 1960s; F. Television and American Culture; G. Film as Writing and Writing as Film; I. Liberal Hollywood and Social "Problems"; J. The Horror Film; K. African American Visual Culture; M. The Male Nude in Photography and Film. Cross-listed with ENGL 145 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 146 (E-Z). Special Topics in Technoculture and Digital Media (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Advanced study of theories and practices of reader and audience interaction with technologies of cultural production in general and digital media in particular. Includes praxis-oriented composition or research. E. Identities and Interactions; F. Cultures and Technologies of the Visual; G. Cultures and Technologies of the Aural; I. Advanced Composition and Rhetoric for Digital Media Authors. Cross-listed with ENGL 146 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 150. Intermediate Video Art (5)**

Lecture, 3 hours; studio, 3 hours; screening, 3 hours. Prerequisite(s): ART 004/MCS 004. Designed to continue work done in ART 004/MCS 004. Covers advanced editing techniques and theory, storyboard, and sound design. Application of media arts to contemporary art practice and new genres, including installation, documentary, experimental, and performance. Equipment provided. Course is repeatable to a maximum of 10 units. Cross-listed with ART 150. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 151 (E-Z). Filmic Bodies (4)** For hours and prerequisites, see segment descriptions. Assesses a multiplicity of filmic genres through the portals of the dancing and mobilized body as related to race, gender, class, and other identifiers. Explores the politics

of movement on film, the mechanics of making film work, and the political economy of dance on film. Dance experience is usually not required. Segments are repeatable. Cross-listed with DNCE 171 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 151F. Ethnographic Representation of Dance on Film: ". . . and then they danced" (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the juncture between representation and presentation in everyday dance genres on film. Explores race, class, tropes of authenticity, and ownership of cultural production through screenings, lectures, and theoretical writings. No previous dance experience required. Course is repeatable. Cross-listed with DNCE 171F. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 151G. Gender, Mechanization, and Shape (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Utilizes film, video, and texts to examine the relationship among gender, mechanization, and shape during the twentieth century. Focuses on the performing arts, industrial and technological design, and the relationship of visual culture to changing notions of gender. Course is repeatable. Cross-listed with DNCE 171G. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 151J. Spectatorship (4)**

Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the nature of film studies through the eyes of the audience. Uses film, videos, and texts (in addition to outside viewing of films in cinematic locales) to formulate how viewing film constructs the viewer's subjectivity and a film's cultural context. Course is repeatable. Cross-listed with DNCE 171J. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 151K. Interruptions as Narration: Fight Scenes, Dance Sequences, and Music Videos (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the deconstruction and reconstruction of the narrative arc. Utilizes selected films to explore performance practices such as fight scenes and dance sequences. Includes screenings both in class and outside of class. Course is repeatable. Cross-listed with DNCE 171K. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 151M. Bollywood (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the vast corpus of films that constitute the genre called Bollywood. Focuses on the genre's music and dance styles. Includes weekly film screenings. No previous dance experience required. Course is repeatable. Cross-listed with DNCE 171M. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 152 (E-Z). Televisual Bodies (4)**

Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes choreographic practices within television broadcast and marketing and their relation to popular culture. Also examines situational or tactical use and misuse of satellite, cablecast, and broadcast television by unintentional audiences that subsequently reconstitute themselves as communities via the programming. Focuses on video as an archival and/or choreographic tool. J. Corporations and Corporealities: Commercials, Culture, and Choreography; K. Television as Location: The Satellite Feed; M. Music Television (MTV) and

Popular Culture. Segments are repeatable. Cross-listed with DNCE 172 (E-Z). *Fulfills the Fine Arts requirement in the College Humanities, Arts, and Social Sciences.*

**MCS 153 (E-Z). Digitized Bodies (4)** Lecture, 3 hours; screening, 2 hours; laboratory, 1 hour. Prerequisite(s): MCS 020; upper-division standing or consent of instructor. Provides a theoretical approach to digital subjectivities, bodies in motion, products, and realities. Addresses issues of liveness, new media, mediated cultural identities, speed, transfer, telepresence, and coded and encoded sexuality within programming. Focuses primarily on the body-computer interface. J. Digital Games, Violence, and the Body; K. Virtual Subjectivity: Persona, Identity, and Body. Segments are repeatable. Cross-listed with DNCE 173 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 154. Media, Gender, and Violence (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines media representations of women and violence. Topics include feminist and queer theory, pornography, sexual violence, state violence, censorship, militarization, policing, and intersections with race, ethnicity, class, sexualities, and citizenship. Analyzes cinema, television, video, gaming, digital, print, and other visual and acoustic media. Course repeatable as topics change to a maximum of 12 units. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 156 (E-Z). South Asian Media and Cultures (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the construction of various South Asian media. Considers confluence of new technologies of production and distribution, as well as the liberalization and globalization of different economies and social structures. E. Bollywood *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 161. Choreographing the Screen (4)** Lecture, 3 hours; screening, 2 hours; term paper, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Focuses on choreographing for the camera and the screen. Topics include video art, classic film choreography, music video, and digital dance technologies. Students prepare a choreographic piece for the camera as a final project. Cross-listed with DNCE 161. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 162. Tool, Technology, Technique (4)** Lecture, 1 hour; practicum, 3 hours; screening, 3 hours; laboratory, 3 hours. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Practicum in video and digital production, with an emphasis on capturing and editing the moving body. Students bring their own video or digital recording device. Editing equipment will be available. Cross-listed with DNCE 162. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 163. Special Topics in Art Criticism and Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ART 006/MCS 006 and ART 160 with grades of "C" or better or consent of instructor. Advanced topics in contemporary art theory and criticism. Examines the reception, analysis, and theoretical underpinning of works of art in relation to contemporary and historical issues in the visual arts. Course is repeatable to a maximum of 12 units. Cross-listed

with ART 161. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 164. Digital Media and Participatory Citizenship (4)** Workshop, 3 hours; project, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical analysis of the new media environment. Explores options of operating as producers of culture. Includes design of an innovative intervention for circulation in the evolving digital media environment, as well as evaluation of its contribution and possible impact. Course is repeatable with consent of department or as topics change to a maximum of 12 units. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 166B. Screenwriting: Outline to First Draft (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): CRWT 166A/MCS 166A/THA 166A or consent of instructor. Explores the fundamentals of screenwriting. Includes story development, plotting, and characterization as they are used in creating a complete script for television or feature film. Cross-listed with CRWT 166B and THA 166B. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 166C. Screenwriting: Rewrites and Writing for Television (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): CRWT 166B/MCS 166B/THA 166B or consent of instructor. Explores the fundamentals of screenwriting. Includes story development, plotting, and characterization as they are used in creating a complete script for television or feature film. Course is repeatable. Cross-listed with CRWT 166C and THA 166C. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 167. Vietnamese and Overseas Vietnamese Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores how Vietnamese people and the Vietnamese diaspora seek to imagine a sense of community in the postwar era through contemporary film and video. Examines the thematics of return, longing, and exile. Reviews some of the texts' bold expressions of gender, sexuality, and identity. Cross-listed with AST 187. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**MCS 168. Hong Kong Cinema: Gender, Genre, and the "New Wave" (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Examines contemporary Hong Kong films, specifically the "New Wave" genre. Particular focus is on the sociopolitical conditions of Hong Kong and its relations with Great Britain and China, the linkages of which set the stage for the films and thematic concerns. Cross-listed with AST 186. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**MCS 169. New Chinese Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of representative films from the People's Republic of China, with a focus on those made during the last decade. Conducted in English; most films have English subtitles. Cross-listed with AST 185 and CHN 185. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 170. Film Noir and Hollywood's German Immigrants (4)** Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the role of German immigrants in the emergence of film noir in 1940s' Hollywood. Examines the revitalization of

Weimar Expressionism in Hollywood cinema. Explores traumatic memory, cultural transfer, exile and displacement in films by German filmmaker refugees including Fritz Lang and Billy Wilder. Cross-listed with CPLT 135 and GER 135. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 171. Reel to Real: Latin American Film and Social Change (4)** Seminar, 3 hours; individual study, 1 hour; screening, 1.5 hours; term paper, .5 hours. Prerequisite(s): SPN 110. Introduces Latin American film as it articulates with contemporary history and current events. Cross-listed with SPN 171. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 172. Topics in Film and Media Genres (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics may include study of a specific film or media genre; comparative genre studies (including a survey of the history and theory of two or more genres); or analysis of the concept of genre in film and media studies. Each segment is repeatable as its content changes to a maximum of 8 units. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 173 (E-Z). International Cinemas (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Considers non-Hollywood cinemas in the national, historical, political, and cultural contexts which produced them. E. Experimental and Avant-Garde Film; F. French New Wave; G. New German Cinema; I. Italian Neorealism; T. Third World Cinema; V. Global Perspectives on the Vietnam War. Cross-listed with CPLT 173 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 174 (E-Z). Comparative Studies in Film (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers film in the context of the other arts. Compares the treatment of various themes or problems in film and other media. E. Film and Literature in the Avant-Garde. Cross-listed with CPLT 174 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 177. Indigenous Media (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines and compares the strategies indigenous videomakers use to counter the imperial gaze of cinema. Discusses possibilities for turning the art form of capitalism and colonialism into a tool for decolonization. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 178. Berlin Metropolis in Literature, Film, Music, and Art (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the metropolis Berlin as gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. A study of Berlin's dramatic transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course is conducted in English. Cross-listed with AHS 120, CPLT 110B, EUR 110B, and GER 110B. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 179. Gender, Media, and Latin America (5)** Lecture, 3 hours; screening, 3 hours; outside research, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores the

way Latin Americans have thought of and represented gender across a variety of media, including essays, film, novel or short story, and performance. Compares the possibilities and limitations of these media for representing gender in the Latin American context. Cross-listed with LNST 109, SPN 179, and WMST 179. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 181. Existentialism in Literature, Film, and Culture (4)** Lecture, 3 hours; screening, 2 hours; outside research, .5 hours; term paper, .5 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the Existentialist movement in literature, film, and culture. Texts range from essays, plays, and novels to documentary and fiction film. Topics include choice, subjectivity, and alienation. Cross-listed with CPLT 181 and FREN 181. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 182. From Expressionism to Epic Theatre: Benn, Brecht, Kafka, and the Bauhaus (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction of the German avant-garde of the twentieth century. Explores expressionism, New Objectivity, the Bauhaus movement, the manifestation of an anti-art in dadaism, and Epic Theatre. Studies works of Franz Kafka in the context of his implicit criticism of the avant-gardist movements of his time. Course is conducted in English. Cross-listed with AHS 121, CPLT 138, EUR 138, and GER 138. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 183 (E-Z). Studies in French and Francophone Cinema (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Studies in the cinema of France and other Francophone countries. Focus is on specific themes in relation to French-language film. Knowledge of French is not required. F. Literature, Cinema, and Culture of the Francophone World; W. Women Directors. Cross-listed with FREN 185 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 184. Japanese Media and Cultural Studies (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates Japanese media and culture including film, television, video games, *manga* (comics), *anime*, music, and print and digital media. Analyzes the function of media relating to issues of national identity, imperial culture, collective memory, and censorship. Includes transnational circulation of Japanese cultural forms, alternative media, and historical changes in technologies. Cross-listed with AST 184 and JPN 184. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 185. Imagining the Nation: Film and Media in Latin America (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Study of the role of media and film in creating a national imaginary in Latin America. Focus is on one region or nation—such as the Andes, the Caribbean, Mexico, Argentina, or Chile—relating local history to the global context. Course is repeatable as topics change to a maximum of 8 units. Cross-listed with LNST 105 and SPN 185. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 186. Media and Movements: Film, Video, Photography, and the Visual Arts (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): AHS 017C or

upper-division standing or consent of instructor. Focuses on key cultural movements or developments in Europe and the United States over the past century. Provides a thematic history of the avant-grade and experimental arts, including painting, sculpture, photography, video, film, performance, installation, and new media art. Cross-listed with AHS 186. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 190. Special Studies (1-5)** Consultation, 1 hour; individual study, 3-12 hours; term paper or project, 1-3 hours. Prerequisite(s): upper-division standing; consent of instructor and program chair. Faculty-driven individual study to meet special curricular needs. Requires a final paper or creative project. Course is repeatable to a maximum of 15 units. *See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.*

**MCS 193. Senior Seminar (4)** Seminar, 3 hours; project, 3 hours. Prerequisite(s): senior standing or consent of instructor. Advanced research in various fields of faculty interest. Includes completion of a research paper and a class presentation of its contents. Topics vary from year to year. Course is repeatable to a maximum of 8 units. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**MCS 198-I. Individual Internship in Media and Cultural Studies (1-4)** Consultation, 1 hour; internship, 2-8 hours; individual study, 1-3 hours; term paper, 1-3 hours. Prerequisite(s): upper-division standing; consent of instructor and the Film and Visual Culture Chair. An internship in a professional organization or with an individual to gain skills and experience for a career in the visual media. Requires a final paper or a creative project. Course is repeatable to a maximum of 12 units. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

## Graduate Courses

**MCS 280. Colloquium in Book, Archive and Manuscript Studies (2)** Colloquium, 2 hours. Prerequisite(s): graduate standing. Addresses current research topics pertaining to the program in designated emphasis. Includes events conducted both on and off campus. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

**MCS 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair. A directed studies course designed to address special curricular problems. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade if specialized topics are studied. Course is repeatable.

**MCS 292. Concurrent Analytical Studies in Media and Cultural Studies (1-4)** Outside research, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. To be taken concurrently with a 100-series course, but on an individual basis. Limited to research, criticism, and written work. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade if specialized topics are studied. Course is repeatable.

# Microbiology

**Subject abbreviation: MCBL**  
**College of Natural and Agricultural Sciences**

Katherine Borkovich, Ph.D., Program Director  
Graduate Program, 1140 Batchelor Hall  
(800) 735-0717 or (951) 827-2599

**microbiology.ucr.edu**

James Borneman, Ph.D., Chair, Microbiology  
Undergraduate Steering Committee  
Program Office, 1223 Pierce Hall  
(951) 827-7294

**cnasstudent.ucr.edu/majors**

### Professors

James Adaskaveg, Ph.D. (Plant Pathology and Microbiology)  
Michael Allen, Ph.D. (Plant Pathology and Microbiology)  
Katherine A. Borkovich, Ph.D. (Plant Pathology and Microbiology)  
James G. Borneman, Ph.D. (Plant Pathology and Microbiology)  
Quan (Jason) Cheng, Ph.D. (Chemistry)  
Michael D. Coffey, Ph.D. (Plant Pathology and Microbiology)  
Donald A. Cooksey, Ph.D. (Plant Pathology and Microbiology)  
David E. Crowley, Ph.D. (Environmental Sciences)  
Shou-Wei Ding, Ph.D. (Plant Pathology and Microbiology)  
Brian A. Federici, Ph.D. (Entomology)  
Sarjeet S. Gill, Ph.D. (Cell Biology and Neuroscience)  
Howard S. Judelson, Ph.D. (Plant Pathology and Microbiology)  
Isgouhi Kaloshian, Ph.D. (Nematology)  
Dmitri Maslov, Ph.D. (Biology)  
Thomas Miller, Ph.D. (Entomology)  
Ashok Mulchandani, Ph.D. (Chemical and Environmental Engineering)  
Leonard Nunney, Ph.D. (Biology)  
A.L.N. Rao, Ph.D. (Plant Pathology and Microbiology)  
Philip Roberts, Ph.D. (Nematology)  
Neal L. Schiller, Ph.D. (Biomedical Sciences)  
Michael Stanghellini, Ph.D. (Plant Pathology and Microbiology)  
Richard Stouthamer, Ph.D. (Entomology)  
Marylynn V. Yates, Ph.D. (Environmental Sciences)

### Professors Emeriti

Dennis D. Focht, Ph.D. (Plant Pathology)  
Edward Platzer, Ph.D. (Biology and Nematology)

### Associate Professors

Karine Le Roch, Ph.D. (Cell Biology and Neuroscience)  
Thomas Eulgem, Ph.D. (Botany and Plant Sciences)  
Hailing Jin, Ph.D. (Plant Pathology and Microbiology)  
Sharon Walker, Ph.D. (Chemical and Environmental Engineering)

### Assistant Professors

Greg W. Douhan, Ph.D. (Plant Pathology and Microbiology)  
Renyi Liu, Ph.D. (Botany and Plant Sciences)  
Wenbo Ma, Ph.D. (Plant Pathology and Microbiology)  
James Ng, Ph.D., (Plant Pathology and Microbiology)  
Joan Pedra, Ph.D., (Entomology)

Caroline Roper, Ph.D. (Plant Pathology and Microbiology)  
 Joel L. Sachs, Ph.D. (Biology)  
 Jason E. Stajich, Ph.D. (Plant Pathology and Microbiology)  
 Emma Wilson, Ph.D. (Biomedical Sciences)

## Major

Microorganisms play key roles in ecosystems and human civilization. They can both cause and prevent a wide array of diseases in animals and plants. They are key components in the manufacturing of bread, cheese, and other food products. Microbes are involved in soil formation, global environmental processes and detoxifying contaminated environments. In addition, they contain a wealth of useful compounds and enzymes for biotechnology.

Students earning a degree will be prepared to continue studies at the graduate level, earn teaching credentials, or enter professional schools in medicine, pharmacy, optometry, dentistry, veterinary medicine, and clinical laboratory science among others. Students will also be trained for technical careers in medicine, agriculture, biotechnology and environmental fields. For information on how to select elective coursework for specific career paths, visit the CNAS Undergraduate Academic Advising Center.

Students in the Microbiology major can obtain either B.A. or B.S. degrees. The B.S. degree offers students with a strong interest in the natural sciences an opportunity to emphasize this aspect of their education. The B.A. degree is available to students who wish to obtain a broader background in the humanities and social sciences than is required of students in the B.S. program.

## University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

## College Requirements

See Degree Requirements, College of Natural and Agricultural Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

## Major Requirements

Some of the following requirements for the Microbiology major may also fulfill the College's breadth requirements. Consult with an advisor for course planning.

1. CoreCurriculum(72-77units)
  - a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
  - b) CHEM001A, CHEM001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
  - c) CHEM 112A, CHEM 112B, CHEM112C
  - d) PHYS 002A, PHYS 002B, PHYS 02LA, PHYS 02LB, PHYS 002C, PHYS 02LC
  - e) MATH 008B or MATH 009A, MATH 009B
  - f) STAT 100A
  - g) BCH 100, or BCH 110A and BCH 110B

### 2. Upper-Division Requirements (36 units)

- a) Major Core (18 units): BIOL 102, BIOL 107A, MCBL 121, MCBL 121L, MCBL 125
- b) Major Electives. A minimum of 18 units from the following to be selected in consultation with a faculty advisor: BIOL 128, BIOL 157, BIOL 158, CBNS 101, ENSC 120, MCBL 120, MCBL 120L, MCBL 122, MCBL 123, MCBL 124, MCBL 141, MCBL 188, MCBL 197<sup>2</sup>, PLPA 134, PLPA 134L

### 3. Other Requirements

For the Bachelor of Science degree, an additional 16 units in upper-division microbiology courses and/or substantive courses in a field or fields related to the major. Acceptable courses include BCH 102, BCH 110C, BIOL 107B, BIOL 109, BIOL 119, ENSC 133, MCBL 190<sup>3</sup>, MCBL 198-I<sup>3</sup>; a more complete list of acceptable courses is available at the CNAS Undergraduate Academic Advising Center.

For the Bachelor of Arts degree, the foreign language requirement may be fulfilled by completing level-four coursework or by demonstrating the equivalent proficiency in one foreign language.

### 4. Bachelor of Science Sample Program<sup>1</sup>

Freshman Year	Fall	Winter	Spring
BIOL 005A, BIOL 05LA; BIOL 005B		5	4
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC	4	4	4
ENGL 001A, ENGL 001B, Humanities/Social Sciences	4	1	1
MATH 009A, MATH 009B, NASC 093	4	4	4
	2		
<b>Total Units</b>	<b>15</b>	<b>14</b>	<b>17</b>
Sophomore Year	Fall	Winter	Spring
BCH 100			4
BIOL 005C BIOL 102	4	4	
CHEM 112A, CHEM 112B, CHEM 112C	4	4	4
ENGL 001C Humanities/Social Sciences	4	4	
MCBL 121			4
PHYS 002A, PHYS 002B, PHYS 002C	4	4	4
PHYS 02LA, PHYS 02LB, PHYS 02LC	1	1	1
<b>Total Units</b>	<b>17</b>	<b>17</b>	<b>17</b>
Junior Year	Fall	Winter	Spring
BIOL 107A	4		
Humanities/Social Sciences Major Electives & Other Reqs.	4	4	4
MCBL 121L MCBL 125		8	8
PHIL 009 <sup>4</sup> STAT 100A	4	3	3
	5		
<b>Total Units</b>	<b>17</b>	<b>15</b>	<b>15</b>
Senior Year	Fall	Winter	Spring
Humanities/Social Sciences Major Electives & Other Reqs.	12	4	12
MCBL 197	3	8	3
	3	3	3
<b>Total Units</b>	<b>15</b>	<b>15</b>	<b>15</b>

## Notes:

<sup>1</sup>Some students will take courses in summer session to (i) reduce the unit load during the normal academic year (ii) complete the degree requirements in less than four years or (iii) enable the acquisition of a minor or double major in four years.

<sup>2</sup>No more than 4 units can be applied toward the Major Electives unit requirement, unless approved by the Microbiology Steering Committee.

<sup>3</sup>No more than 4 units can be applied toward the Other Requirements unit requirement, unless approved by the Microbiology Steering Committee.

<sup>4</sup>Students are encouraged to take a class in ethics.

## Graduate Program

The Graduate Program in Microbiology is an interdisciplinary program with participating faculty from the departments of Biology, Cell Biology and Neuroscience, Chemical and Environmental Engineering, Chemistry, Entomology, Environmental Sciences, Plant Pathology and Microbiology, and the Division of Biomedical Sciences. Faculty research interests are concentrated in several disciplines in the areas of basic and applied microbiology. These disciplines include the following:

- Microbial Pathogenesis
- Environmental Microbiology and Ecology
- Microbial Evolution, Genomics, and Meta-genomics
- Molecular and Cellular Microbiology

**Admission** For admission into the graduate program in Microbiology, a student must have a B.A. or B.S. degree from an accredited institution and an academic record that satisfies the minimum admission standards established by the UCR Graduate Division. In addition, all applicants must submit results of the GRE General Test (verbal, quantitative and analytical) at the time of application.

Although no specific undergraduate degree specialization is required, applicants should have an adequate background in the physical and biological sciences, including the following or equivalent courses:

CHEM 001A, CHEM 001B, CHEM 001C (General Chemistry), CHEM 112A, CHEM 112B, CHEM 112C (Organic Chemistry), BCH 110A, BCH 110B (Biochemistry), MATH 009A, MATH 009B (Calculus), STAT 100A or STAT 120A (Statistics), BIOL 102 (Genetics), BIOL 121A/MCBL 121A, BIOL 121L/MCBL 121L (Microbiology), BIOL 107A or BCH 110C (Molecular Biology)

This list is intended to represent the minimum background required for students wishing to pursue a graduate degree in Microbiology. Additional course work and laboratory experience in microbiology, biochemistry or genetics is highly desirable. However, upon the recommendation of the graduate advisory committee, occasionally a student may be admitted into the graduate program with one or more course

work deficiencies; such students must satisfy these course work deficiencies usually within the first and no later than within the second year of graduate study.

**Course work** The program is designed to prepare students for teaching and research careers in colleges and universities, as well as basic and applied research in private, industrial and government laboratories. To attain this goal, a three-tiered curriculum has been designed whereby students are expected to complete the following:

1. A core sequence of classes in microbiology: MCBL 201 (Functional Diversity of Prokaryotes) or MCBL 202 (Microbial Pathogenesis and Physiology), BIOL 221/MCBL 221 (Microbial Genetics), and MCBL 211/SWSC 211 (Microbial Ecology)
2. A selection of elective courses in microbiology and other relevant fields chosen in consultation with the student's major professor and the advisory committee in order to develop depth in particular areas of specialization
3. Research training in specific areas of microbiology

The program stresses the importance of innovative and independent laboratory research as the major component of the student's education.

In addition to the above course work, students must attend one seminar per week each quarter in programs collaborating with Microbiology. Students are also required to present one seminar each year. These seminars can be either on the student's thesis research or related topics and can be presented in any of several program student seminar series.

Upon entering the program, a student advisory committee is appointed for each student to help plan a program of study. The committee consists of the student's major professor, who serves as chair, and two other professors from the program with expertise in the student's area of interest. Graduate students must meet at least annually with their advisory committee to plan their courses; however, students are encouraged to meet with their committee more often. Minutes of the meeting, prepared by the chair, are approved by the rest of the committee and then placed in the student's file. In addition, prior to advancement to candidacy, students present the advisory committee with a written summary of their research progress and plans at the beginning of each academic year.

## Master's Degree

M.S. students must fulfill the requirements for Plan I (Thesis) of the Graduate Council. They must complete the core series of courses and three additional graduate level courses chosen in consultation with the student advisory committee. Plan I requires 36 units, of which 24 must be in graduate level courses. No more than 6 units of MCBL 290 level courses may be used to satisfy this unit requirement. The student must also submit an acceptable research thesis. The M.S. thesis committee,

consisting of three members, which may be the same as the student advisory committee, is nominated by the graduate advisor after consultation with the student. The committee, once approved by the graduate dean, becomes responsible for the student's academic guidance and evaluation. The master's degree is conferred at the end of the academic quarter in which all requirements have been satisfied.

**Normative Time to Degree** 6 quarters

## Doctoral Degree

Ph.D. students must meet all requirements of the Graduate Council. Students satisfactorily complete the core class requirements and a program of courses approved by the student advisory committee. The Ph.D. degree is awarded upon passing the preliminary and qualifying examinations and demonstrating an ability to carry out original research by preparing and submitting an acceptable dissertation.

Students enrolled in the Ph.D. program are expected to become actively engaged in a research project no later than the end of their first year, and research progress is monitored by the student's advisory committee until the student advances to candidacy and a dissertation committee is appointed.

**Preliminary Examination** The preliminary examination, consisting of a written, comprehensive examination is based on general microbiology and required material in the student's area of specialization. If a student fails this examination, the advisory committee recommends either additional course work in specific areas of weakness, transfer to a terminal M.S. degree program, or withdrawal from the program. The preliminary examination may only be repeated once and must be passed for the student to continue in the Ph.D. program. The preliminary examination is normally taken in the spring quarter of the second year.

**Oral Qualifying Examination** After completion of the preliminary examination, the qualifying committee is established, and the oral qualifying examination is normally taken no later than the eighth quarter (year three) of academic work, not counting summer quarters.

A qualifying committee is nominated by the graduate advisory committee and submitted to the graduate dean for approval. Suggestions of potential members of the qualifying committee may be submitted to the advisory committee by the student and the student's major professor. The qualifying committee is composed of five faculty members: three with expertise in the area of specialization in microbiology, one representing a different area from microbiology, and one outside member. The student's major professor may not serve on the qualifying committee. Prior to the oral qualifying examination, the student submits a written dissertation research proposal to the members of the qualifying committee. The oral examination covers the student's area of specialization and research field and must be passed for the student to continue in the program. Upon

successful completion of the qualifying examination, the student is advanced to candidacy. The qualifying examination may be repeated only once.

**Dissertation and Final Oral Examination** The dissertation committee is nominated by the graduate advisor for approval by the graduate dean (upon successful completion of the qualifying examination) and is composed of the student's major professor and at least two other faculty members suggested by the student and the student's major professor. Before approval of the dissertation, the student is expected to present orally the dissertation research at an announced defense seminar.

**Teaching Requirement** One quarter of teaching experience is required, which may be satisfied by serving as a teaching assistant in any of the microbiology courses listed.

**Foreign Language Requirement** None

**Normative Time to Degree** 15 quarters

## Upper-Division Courses

### MCBL 120. Introduction to Plant Pathology (3) F

Lecture, 3 hours. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. An introduction to the study of plant diseases. Topics include diseases and disease-causing agents, host-pathogen interaction during disease development, and strategies for disease management. An optional, separate laboratory is offered. Cross-listed with BIOL 120 and PLPA 120. **Stanghellini**

### MCBL 120L. Introduction to Plant Pathology

**Laboratory (1) F** Laboratory, 4 hours. Prerequisite(s): BIOL 005A, BIOL 005B; concurrent enrollment in BIOL 120/MCBL 120/PLPA 120 or consent of instructor; BIOL 121/MCBL 121 and BIOL 124/MCBL 124 recommended. Covers fundamentals in the use of laboratory instruments and techniques for the detection, isolation, and identification of representative infectious agents that cause disease in plants. Cross-listed with BIOL 120L and PLPA 120L. **Stanghellini**

### MCBL 121. Introductory Microbiology (4) F, W

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently); or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers evolutionary origins of metabolic diversity, bacterial and viral molecular genetics, and an introduction to microbial pathogenesis. Cross-listed with BIOL 121. **Ma, Pedra, Roper**

### MCBL 121L. Microbiology Laboratory (3) W, S

Lecture, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 121/MCBL 121 with a grade of "C-" or better. Laboratory exercises in diagnostic bacteriology, basic virology, and epidemiology. Includes fundamental quantitative and diagnostic microbiological procedures, basic mechanisms of microbial genetic exchange, and a project examining bacterial epidemiology. Cross-listed with BIOL 121L. **Borneman, Coffey**

**MCBL 122. Food Microbiology (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 121/MCBL

121 with a grade of "C-" or better; BIOL 121L/MCBL 121L. Covers spoilage and preservation of food; food quality and indicator organisms; the role of microorganisms in the production of dairy goods and fermented beverages; food-borne pathogens and microbiological production of toxins; and classical and modern molecular methods for detection of food microorganisms. Cross-listed with BIOL 122. **Focht**

**MCBL 123. Introduction to Comparative Virology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. Considers viruses as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Compares the major groups of viruses to each other with respect to their biological and biochemical properties, molecular and genetic characteristics, and modes of replication. Cross-listed with BIOL 123 and PLPA 123. **Rao**

**MCBL 124. Pathogenic Microbiology (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 121/MCBL 121 with a grade of "C-" or better or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers research strategies for examining microbial pathogenic mechanisms. Cross-listed with BIOL 124. **Cooksey, Gill**

**MCBL 125. Experimental Microbiology (4) S** Lecture, 1.5 hours; laboratory, 8 hours. Prerequisite(s): upper division standing in Microbiology, BIOL 102, BIOL 107A, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L or consent of instructor. Introduces the process of performing experimental research in a microbiology laboratory. Teaches skills used in formulating hypotheses, designing experiments, performing laboratory experiments, analyzing data, and preparing and presenting research in written and oral formats. Experimental systems utilized vary from quarter to quarter. **Borkovich**

**MCBL 130. Microbial Threats and Biodefense (3) S** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 121L/MCBL 121L. Explores the historical development, strategies, and status of biodefense research. Addresses the impact of fungi, mycotoxins, bacteria, and viruses on human, animal, and plant health. Includes natural outbreaks and pandemics, epidemiology, detection technologies, ethics, and biodefense. Considers how these topics relate to plant, animal, and human health, as well as agriculture. **Coffey**

**MCBL 133. Environmental Microbiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C; or consent of instructor. Introduction to nonpathogenic microorganisms in the environment. Topics include an introduction to microbial biology and microbial and metabolic genetic diversity; methods; symbiotic interactions; biofilms; and geomicrobiology and biogeochemistry. Explores life in extreme environments and the effects of the physical and chemical environment on microbes. Cross-listed with ENSC 133 and SWSC 133.

**MCBL 141. Public Health Microbiology (4)** Lecture, 4 hours. Prerequisite(s): BIOL 002 or both BIOL 005A and BIOL 05LA; BIOL 003 or BIOL 005B; upper-division standing; or consent of instructor. Introduction to transmission of human pathogenic microorganisms through environmental media, including drinking water, wastewater, and air. Topics include characterization of environmentally transmitted pathogens, microbial risk assessment, sampling and detection methods for microorganisms in environmental samples, waterborne disease outbreaks, recycling or re-

use of wastewater, microbial regulations and standards, and indoor air microbiology. Cross-listed with ENSC 141 and SWSC 141. **Yates**

**MCBL 188. Microbiology Diagnostics (4)** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 121/MCBL 121, BIOL 121L/MCBL 121L. Covers microscopic and molecular diagnostic procedures used in a clinical/forensics microbiology laboratory. Utilizes in a research lab setting selected live microbial material (including bacteria and fungi). Addresses techniques employed in the processing and identification of pathogenic microbes, including safe laboratory practices for working with biohazards. **Coffey**

**MCBL 190. Special Studies (1-5) F, W, S, Summer** Individual study, 3-15 hours. Prerequisite(s): permission of instructor and major chairperson. Provides an opportunity to meet specific curricular needs. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. No more than 4 units can be applied toward the degree without permission from the Microbiology Steering Committee.

**MCBL 197. Research for Undergraduates (1-4)** directed research, 3-12 hours. Prerequisite(s): consent of instructor; upper-division standing. Individual research in microbiology performed under the guidance of the staff or faculty. Letter grades are assigned to students presenting a research paper; other students are graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

**MCBL 198-I. Individual Internship in Microbiology (1-12)** Written work, 1-12 hours; internship, 2-24 hours. Prerequisite(s): BIOL 121/MCBL 121; upper-division standing; consent of instructor. Provides opportunity for career exploration in microbiology. Includes supervision by a faculty member and an off-campus sponsor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

## Graduate Courses

**MCBL 201. Functional Diversity of Prokaryotes (3) W** Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BIOL 121/MCBL 121; or equivalents; or consent of instructor. In-depth coverage of bacterial and archaeal bioenergetics, cell structure, diversity of metabolism, regulation of metabolism, growth, and biosynthesis, and cell-cell interactions between prokaryotes and eukaryotes. Project involves analysis of metabolic pathways from complete, annotated, prokaryotic genome sequences. Cross-listed with ENSC 205 and PLPA 201.

**MCBL 202. Microbial Pathogenesis and Physiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An in-depth examination of microbes that cause human and animal disease. Explores physiology and pathogenesis of bacterial, fungal, protist, and viral pathogens and their vectors. Includes study of antimicrobial drugs and resistance mechanisms, mode of action for toxins, immunological responses of the host, epidemiological considerations, and development of control practices. **Le Roch**

**MCBL 205. Signal Transduction Pathways in Microbes and Plants (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in the biological sciences, BIOL 107A or BIOL 113 or BIOL 114 or CBNS 101; or consent of instructor. Advanced topics in signal transduction pathways that regulate growth and development in plants and prokaryotic and eukaryotic microbes. Areas covered include two-component regulatory systems; quorum sensing; signaling via small and heterotrimeric G proteins; mitogen-activated pro-

tein kinase cascades; cAMP signaling; photoreceptors; plant hormone signaling; responses to low-oxygen stress; calcium signaling; and plant pathogenesis. Cross-listed with BCH 205, BPSC 205, CMDB 205, GEN 205, and PLPA 205. **Borkovich, Cutler, Eulgem, Kaloshian, Roper, Yang**

**MCBL 206. Gene Silencing (3)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate standing, BIOL 107A or CBNS 101; or consent of instructor. An in-depth coverage of mechanisms, functions, and applications of RNAi and related gene regulatory pathways guided by small RNAs such as siRNAs and miRNAs in plants and animals. Cross-listed with CMDB 206 and GEN 206. **Chen, Ding**

**MCBL 210. Molecular Biology of Human Disease Vectors (3)** Lecture, 2 hours; seminar, 1 hour. Prerequisite(s): consent of instructor. Covers the molecular aspects of vectors transmitting most dangerous human diseases. Involves lectures and student presentations about current issues in molecular biology and genomics of vector insects and pathogens they transmit. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 210 and ENTM 210.

**MCBL 211. Microbial Ecology (3) S, Odd Years** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Application of ecological principles to microbial communities. Emphasizes methods for analysis of diversity and community structure and statistical methods relating genetic and biochemical fingerprints to functional properties. Case studies explore applications for agriculture, disease biocontrol, and bioremediation of environmental contaminants. Cross-listed with SWSC 211. **Borneman, Crowley, Sachs, Stajich**

**MCBL 221. Microbial Genetics (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102. In-depth coverage of the genetics of microbes. Emphasizes the primary data and the foundation of modern techniques using viruses, archaea, prokaryotes, and eukaryotes. Includes genome sequences and organization, plasmids and other vectors, and mutation and genetic screens. Also covers transposable elements, recombination, and regulation of gene expression, development, and pathogenesis. Cross-listed with BIOL 221 and PLPA 226. **Borkovich, Borneman, Ma, Mathews, Ng, Rao**

**MCBL 241. Special Topics (2)** Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Oral presentations and intensive small-group discussion of selected topics in each faculty member's area of specialization. Course content emphasizes recent advances in the special topic area and varies accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with PLPA 241.

**MCBL 250. Seminar in Microbiology (1) S** Seminar, 1 hour. Prerequisite(s): graduate standing. Formal seminars by graduate students, faculty, and invited scholars on selected topics in microbiology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MCBL 262. Seminar in Molecular Biology and Genomics of Disease Vectors (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Seminar series, sponsored by the Center for Disease-Vector Research at the Institute for Integrative Genome Biology, provides an opportunity for graduate students to discuss current issues of molecular biology and genomics of vector insects and pathogens they transmit with guest speakers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with ENTM 262.

**MCBL 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Experimental or literature studies on specifically selected topics conducted under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MCBL 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing. Directed research in microbiology performed prior to advancement to candidacy in preparation for thesis or dissertation projects. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MCBL 299. Research for Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing. Original research in the area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Middle East and Islamic Studies Minor

**Subject abbreviation: MEIS**  
**College of Humanities, Arts, and Social Sciences**

Fariba Zarinebaf, Ph.D., Chair  
Department Office, 2230 Watkins Hall  
(951)827-5509; [cherif@ucr.edu](mailto:cherif@ucr.edu)

### Committee in Charge

Muhammad Ali, Ph.D. (Religious Studies)  
Ebru Erdem, Ph.D. (Political Science)  
Sherine Hafez, Ph.D. (Women's Studies)  
Erith Jaffe-Berg, Ph.D. (Theatre)  
Ruhi Khan, Ph.D. (Media and Cultural Studies)  
Benjamin Liu, Ph.D. (Hispanic Studies)  
Susan Ossman, Ph.D. (Anthropology)  
Jeff Sacks, Ph.D. (Comparative Literature & Foreign Languages)  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

Administered through the Interdisciplinary Studies Office, the minor in Middle East and Islamic Studies offers a broad course of interdisciplinary and theoretically informed study. Students draw upon the range of materials covered in departments including Anthropology, Comparative Literature, Creative Writing, Hispanic Studies, History, Media and Cultural Studies, Religious Studies, Theatre, Political Science, and Women's Studies, as they gain critical knowledge of the texts, practices, institutions, and histories of the Middle East and Islamic traditions in diverse, multilingual, and global contexts. The study of at least one language, which pertains to students' areas of interest, is strongly encouraged but not required.

1. Select two from the required courses (8 units)

GBST 169/ANTH 169, HIST 121, POSC 156, RLST 111, RLST 113, WMST 168

2. Select four from the elective courses (16 units)

a) Arabic Literatures and Cultures  
ARLC 120, ARLC 151/CPLT 151/MEIS

151, ARLC 152/CPLT 152, ARLC 154/CPLT 154/PHIL 128, ARLC 156/CPLT 156/MEIS 156/RLST 156

- b) Anthropology  
ANTH 136, ANTH 1401
- c) Asian Studies  
AST 167/CPLT 167
- d) Comparative Literature  
CPLT 153
- e) History  
HIST 124, HIST 125, HIST 126
- f) Middle East and Islamic Studies  
MEIS 199
- g) Political Science  
POSC 107, POSC 120, POSC 133, POSC 152
- h) Religious Studies  
RLST 116, RLST 124K, RLST 149, RLST 150, RLST 151, RLST 155/PHIL 155
- j) Women's Studies  
WMST 151, WMST 162/RLST 162

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Upper-Division Course

**MEIS 151. Palestine/Algeria (4)** Lecture, 3 hours; screening, 6 hours per quarter; extra reading, 24 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Considers two distinct and related literary and historical moments: Palestine and Algeria. Topics include the relations between language and context; literature and literary historiography; genre and idiom; violence and the body; and the state and institutional practices of reading. Cross-listed with ARLC 151 and CPLT 151.

**MEIS 155. Introduction to Arabic Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic literature that focuses on language and rhetoric. Considers major issues such as colonialism, secularism, modernity, language, and the state. Utilizes texts from literature, the law, and philosophy. Cross-listed with ARLC 155, CPLT 155, and RLST 157.

**MEIS 156. Jews and Arabs (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with ARLC 156, CPLT 156, and RLST 156.

**MEIS 158. Islam and Psychoanalysis (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores contemporary psychoanalytic readings of Islam to consider the relationship between Islam and Orientalism, Orientalism and psychoanalysis, and psychoanalysis and Islam. Cross-listed with ARLC 158, CPLT 158, and RLST 158.

**MEIS 199. Senior Research (4)** Consultation, 1 hour; extra reading, 6 hours; term paper, 3 hours. Prerequisite(s): senior standing; consent of Middle

East and Islamic Studies Steering Committee chair. Directed original research in topics related to the Middle East, Islamic studies, or Islamic cultures. Administered under the direction of members of the Middle East and Islamic Studies Steering Committee or an approved faculty member.

## Music

**Subject abbreviation: MUS**  
**College of Humanities, Arts, and Social Sciences**

Deborah A. Wong, Ph.D., Chair  
Department Office, ARTS 129  
(951) 827-5424; [music.ucr.edu](mailto:music.ucr.edu)

### Professors

Byron Adams, D.M.A.  
Paulo C. Chagas, Ph.D.  
Walter Aaron Clark, Ph.D.  
Deborah A. Wong, Ph.D.

### Professors Emeriti

Frederick K. Gable, Ph.D.  
Anthony F. Ginter, Ph.D.  
Donald C. Johns, Ph.D.

### Associate Professors

Rogerio Budasz, Ph.D.  
Timothy Labor, Ph.D. (Media and Cultural Studies)  
René T.A. Lysloff, Ph.D.  
Leonora Saavedra, Ph.D.

### Assistant Professor

Jonathan Ritter, Ph.D.

\*\*

### Lecturers

Janet Beazley, D.M.A. Collegium Musicum  
Barbara A. Bennett, D.M.  
Edward Bruner, D.M.A. Choral Society  
Ruth Charloff, D.M.A. Orchestra and Chamber Singers  
Tagumpay de Leon, M.S. Rondalla Ensemble  
Rev. Shuichi Thomas Kurai, B.S., Taiko Ensemble  
Audrey J. Lamprey, M.M.

### Vocal and Instrumental Instruction

Kimberly K. Amin, M.M. *Piano*  
Ed Best, B.A., *Scottish Drum*  
William Casale, Ph.D. *Double Bass Viol*  
Ralph Cato, D.M.A. *Voice*  
Celia Chan Valerio, D.M.A., *Harp*  
David W. Christensen, M.M. *Organ and Carillon*  
Robert D. Dominguez, *Percussion*  
Larry Flahive, *Jazz Piano*  
Lisa Geering, B.A. *Oboe*  
Eileen Holt, M.M. *Flute*  
Charles Koster, M.A. *Bassoon*  
Audrey J. Lamprey, M.M. *French Horn*  
Frances C. Moore, M.A. *Violin and Viola*  
Patrick L. Read, M.A. *Classical Guitar*  
Manon Robertshaw, M.M. *Cello*  
Robert L. Scarano, B.A. *Jazz Guitar*  
Leslie Schroerlucke, M.M. *Clarinet*  
Camilia Voin, B.M. *Voice*  
Ian Whitelaw, *Bagpipe*  
Matt Zebley, D.M.A., *Saxophone*

## Majors

The Music Department offers undergraduate majors leading to the B.A. in Music and the B.A. in Music and Culture.

**Scholarships** Students have access to student assistantships, work-study, Gluck Fellowships, and scholarships such as the Chancellor's

Performance Award. For further information or a department tour, call the Music Department, (951) 827-3343.

**Performance** Throughout each academic year the Department of Music and Cultural Events sponsor more than 50 formal and informal concerts and recitals by campus ensembles, students, members of the performance faculty, and distinguished visiting artists. The department also sponsors the UCR Contemporary Music Series. Most of the Music Department concerts are open to the public.

**Facilities** The department's facilities include an electronic/computer music studio, practice rooms equipped with Steinway and Yamaha pianos, teaching studios, a carillon console, and computerized ear training equipment. The instrument collection, in addition to complete families of the modern orchestral and band instruments, is particularly rich in historical replicas: three pipe organs, two harpsichords, virginal, clavichord, forte-piano, lutes, theorbo, viols, and a large group of Renaissance and Baroque wind instruments. The department also owns the instruments for three Asian ensembles: Javanese gamelan, Japanese Taiko, and Filipino Rondalla.

The **UCR library** has strong music research collections located in three facilities. Approximately 35,000 books about music may be found in the Rivera Library, along with journal backfiles and microforms. The Music Library, located in room 054 Arts Building (lower level), provides listening equipment and houses collections of some 12,000 LPs, more than 2,000 CDs, and 22,000 music scores. A growing collection of audio CD-ROMs is also available. The library's collections of film, video tapes, and laser discs, along with playback equipment, are housed in the Media Library, located in the Humanities and Social Sciences building. Online access to these collections and a variety of electronic resources is provided through MELVYL (the UC online catalog) and the library's electronic catalog, INNOPAC.

## Music Major

A Music major not only gains a knowledge and awareness of music as a worldwide cultural phenomenon but develops critical acumen through a manifold approach to sound in its many cultural settings. Historical, ethnographic and critical studies are complemented and deepened by music-writing and auditory skills (developed largely in the context of Western music), and by ensemble performance (available in Indonesian, Philippine, Japanese and Latin American as well as traditional Western forms) and by individual instrumental or vocal study.

## Music and Culture Major

The Music and Culture major offers an approach predominantly scholarly and critical to music as culture from the perspective of research, criticism, and interpretation, with an emphasis on historical and ethnographic approaches. It is oriented primarily toward

understanding music as a culturally expressive form. Courses in music and/or dance performance are required but are positioned more broadly within the major as a means to explore interrelationships between music and other forms of performance.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

### Music Major

The major requirements for the B.A. degree in Music are as follows:

1. Lower-division requirements (13-15 units plus keyboard proficiency)
  - a) MUS 030A, MUS 030B, MUS 030C
  - b) MUS 031A, MUS 031B, MUS 031C or proficiency for MUS 131A
  - c) Keyboard proficiency
2. Upper-division requirements (63 units plus quarterly ensemble)
  - a) MUS 112A, MUS 112B, MUS 112C
  - b) MUS 130A, MUS 130B
  - c) MUS 131A, MUS 131B, MUS 131C or proficiency
  - d) Six quarters of MUS 180 (E-Z) or MUS 181 (E-Z)
  - e) Twenty-eight (28) additional upper-division units from the following. (No performance courses numbered MUS 160 to MUS 181 (E-Z) may be used to satisfy this requirement.)
    - (1) MUS 138
    - (2) One course in music in world cultures (MUS 122-129)
    - (3) One course from the MUS 113-119 series, MUS 187, or MUS 191 (E-Z)
  - f) Participation in a major ensemble (MUS 160-166, MUS 168/AST 168-MUS 173) each quarter

**Note** Because of additional performance requirements appropriate to the music curriculum, Music majors have been granted an exemption from the 80-unit limit on courses in the major so that 102 music units may be counted toward the B.A.

Students emphasizing the study of music in world culture are advised to take at least two additional courses in the MUS 120 series in addition to MUS 168/AST 168.

Students emphasizing Western music history are advised to take at least two additional courses in that area.

Students emphasizing music theory and composition are advised to take MUS 137 and at least two additional courses in music theory or

composition.

Students seeking a teaching credential are advised to take MUS 133, MUS 150A, MUS 150B, MUS 150C, MUS 150D, MUS 151, and MUS 152. Consult the Graduate School of Education for credential requirements.

**Examinations and Auditions** The ability to play simple piano music is required of all majors. Students lacking keyboard proficiency when the major is declared must enroll in MUS 080P to prepare them for the proficiency examination. This examination should be passed by the junior year. Consult the department for examination requirements.

All students intending to enroll in MUS 030A must take a music theory diagnostic examination, which is given at the beginning of instruction.

MUS 031A, MUS 031B, and MUS 031C are taken until proficiency for admission to MUS 131A is achieved. The completion of MUS 131A, MUS 131B, and MUS 131C is required for graduation.

All students normally participate in a major ensemble each quarter. Admission to any ensemble course is by consent of instructor. All students intending to participate in an ensemble course must audition during registration.

**Fees** All students enrolled in MUS 080 (E-Z), MUS 081 (E-Z), MUS 180 (E-Z), and MUS 181 (E-Z) must pay a lesson fee (check with the department office for current fee).

Enrollment in one section of MUS 180 (E-Z) or MUS 181 (E-Z) per quarter is provided at no additional cost to upper-division Music majors for a maximum of six quarters.

## Music and Culture Major

All majors must enroll in at least one music ensemble each quarter. However, students may enroll in DNCE 067A through DNCE 075B instead of, or in addition to, any of the music ensemble courses.

In addition, the major requirements for the B.A. degree in Music and Culture are as follows:

1. Lower-division requirements (17-19 units)
  - a) MUS 030A, MUS 030B, MUS 030C
  - b) MUS 031A, MUS 031B, MUS 031C
  - c) ANTH 001, SOC 001, DNCE 005, or DNCE 007
2. Upper-division requirements (59 units)
  - a) Music courses (39-49 units)
    - (1) Western Music History: MUS 112A, MUS 112B, MUS 112C, MUS 114, MUS 116, MUS 117, MUS 136, MUS 191 (E-Z)
    - (2) Ethnomusicology: MUS 121, MUS 124/AST 124, MUS 125, MUS 126/ANTH 177/WMST 126, MUS 127/ANTH 176/AST 127/ DNCE 127/ETST 172, MUS 128/ ANTH 128/AST 128/DNCE 128/ THEA 176, MUS 129/ETST 118, MUS 140/HISA 139
    - (3) Individual Study: MUS 190, MUS 194, MUS 195, MUS 199H

b) Other upper-division courses (12–24 units)

- (1) Dance History (4–8 units):  
DNCE 130/ANTH 130, DNCE 141,  
DNCE 142, DNCE 171 (E-Z),  
DNCE 172 (E-Z), DNCE 173 (E-Z)
- (2) Anthropology or Sociology (4–8 units)
- (3) English or Media and Cultural Studies (4–8 units)
- (4) Other courses in the Social Sciences, Humanities, or Arts could count towards these units if the students petitions and an advisor's permission is granted.

## Minor

The minor in Music is designed for students who wish to continue their musical studies while pursuing another major. Within the required 24 upper-division units, the minor provides basic skills in music theory and first-level studies in music history and literature while still offering modest flexibility to pursue individual interests.

1. Lower-division preparation: (16 units)
  - a) MUS 001 or equivalent
  - b) MUS 030A, MUS 030B, MUS 030C
2. Upper-division requirements (24 units)
  - a) Eight (8) units from MUS 112A, MUS 112B, MUS 112C
  - b) Four (4) units from MUS 122-129
  - c) Eight (8) units selected from MUS 122-129, MUS 130A, MUS 130B, MUS 133-139, MUS 191 (E-Z)
  - d) Four (4) additional units in ensemble performance

As a freshman or sophomore, the student should complete MUS 030A, MUS 030B, MUS 030C (Harmony). This is a prerequisite for all later studies in the minor. Harmony has a prerequisite of MUS 001 (Introduction to Basic Musical Concepts) or the equivalent.

Two required courses from MUS 112A, MUS 112B, MUS 112C should be completed following MUS 030A, MUS 030B, MUS 030C and not later than the junior year.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under

International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

The Department of Music offers the M.A. and Ph.D. degrees in Music with a specialization in three areas: digital composition, ethnomusicology, and musicology. Students are encouraged to view music in the broad context of culture: communication between the intradisciplinary areas is built into the program, and courses outside the department are either encouraged or required in order to develop an interdisciplinary outlook.

**Admission** Students may apply for a terminal M.A. degree. Students intending to pursue a Ph.D. as their final degree objective should apply directly to the Ph.D. program. Students with a B.A. should follow the requirements for the M.A. for the first six quarters.

Students are admitted into the graduate program in the fall quarter only. Though applicants must provide GRE General Test scores, scores for the music subject area are not required. All prospective students must submit an example of their writing.

Composers must also submit musical scores, recordings, or both and include a statement on technical experience. It is required that students entering the graduate program in digital composition have 1) basic computer word-processing and spreadsheet skills, 2) demonstrated proficiency with a computer music notation program, 3) demonstrated proficiency with a sequencer and audio editor, and 4) at least one of the following: programming fluency in a computer language, fluency in a digital audio signal processing prototyping language, hardware experience, analog studio experience, nonlinear video editing experience, music production/studio recording experience, a scientific computing skill, or a multimedia design skill. Composers must also submit recorded evidence of performance ability. This may be either a recording of one or more performances on a preferred instrument or an aspect of the composition portfolio stated above in which the student has a significant performance role in either an acoustic music or digital capacity. Digital composition students may optionally include an additional non-academic writing sample which may be fiction, technical, or business writing.

Musicology and composition students must have an M.A. or undergraduate degree in music, including piano proficiency and musicianship (ear training). Digital composition students must have an M.A. in music or undergraduate degree in music.

Ethnomusicology students must have a background in music or anthropology. Evidence of superior intellectual ability in another field combined with some demonstrable expertise in any

musical tradition is also viewed favorably.

Entering graduate students in digital composition and musicology must take an advisory examination. In musicology, admission to full graduate status is contingent upon the removal of any deficiencies in undergraduate preparation as shown by this advisory examination. In digital composition, deficiencies in undergraduate preparation must be completed by the time of the Comprehensive Examination.

## Master's Degree

**The M.A. Degree** The Department of Music offers the M.A. degree in Music under Plan I (Thesis).

**Requirements.** In addition to the coursework indicated below, all students must meet the following requirements.

**1. Comprehensive examination.** All students must pass a written and oral comprehensive examination testing knowledge over a broad spectrum of their field of study. The ethnomusicology exam covers three broad areas: geocultural area studies, the history of ethnomusicology, and critical issues in ethnography. The digital composition and musicology exams cover three broad areas: music theory, music history and critical issues in theory and/or musicology. Digital composition students must also take a practical examination in basic computing and digital music skills, a composition test, and an entrance audition (instrumental or vocal).

The comprehensive examination can be passed at the M.A. or at the Ph.D. level. Passing the exam at the PhD level is a requirement for students intending to pursue a PhD. Failure to pass the comprehensive examinations after two opportunities constitutes grounds for dismissal from the program.

**2. Foreign Language Requirement.** Students must demonstrate a reading knowledge of a foreign language, of use in scholarship within their discipline or chosen to support their research and creative interests, with the approval of the department. The requirement can be satisfied either by examination or by enrolling in 4 quarters of a language course with a grade of "B" or better.

**3. Additional track requirements.** Musicology and ethnomusicology students must present a portfolio containing their CV, and representative seminar and conference papers. The portfolio offers the student a chance to organize their work in a manner that shows both their past performance and their future potential.

The portfolios will be evaluated by the ethnomusicology or musicology faculty, respectively, coordinated by the graduate advisor.

**4. Course Work** Each area requires a minimum of 48 units of graduate (200 series) or upper-division undergraduate courses (100 series), these may include up to 8 units of MUS 299 (Thesis Preparation). Twenty four units must be graduate level. None may be MUS 291.

Performance courses (MUS 160-181) do not

count toward the degree, with the exception of 4 units in world music ensembles required of ethnomusicology students (see requirements below). The courses comprising the remaining required units are disposed differently in each of the three areas as specified below.

### 1. Digital Composition

#### a) Core requirements

MUS 200 Music Bibliography

MUS 201 Proseminar in the Analysis of Western Music

MUS 206 Proseminar in Musicology or

MUS 207b Current Approaches in Ethnomusicology

Music 256 Electroacoustic and Computer Music Composition

MUS 258 Graduate Composition Seminar (repeatable)

MUS 265 Electroacoustic Music: History, Theory, and Aesthetics

MUS 293 Composition Practicum (6 units)

#### b) Three of the following repeatable courses:

Music 232 Soundtrack Composition

Music 249 Audiovisual and Multimedia Composition

Music 251 Music in Computer Games

Music 257 Music and Audio Production

Music 259 Musical Semiotics: Approaches to Meaning and Form

Music 264 Music in Fantasy and Science Fiction

### 2. Ethnomusicology

#### a) Core courses

MUS 200 Music Bibliography

MUS 207a The Development of Ethnomusicology

MUS 207b Current Approaches in Ethnomusicology

MUS 255 Field Methods in Ethnomusicology

#### b) At least two quarters of the following courses:

MUS 270 Special topics in ethnomusicology

MUS 271 Area Studies Research in Music

#### c) Two of the following courses:

MUS 113 Brazilian Music

MUS 117 Music and Ritual

MUS 118 Music, Politics and Social Movements

MUS 119 Javanese Music and Culture

MUS 120 Contemporary Native American Music

MUS 122 Music and Performance in the Andes

MUS 123 Southeast Asian Performance

MUS 124 Music of Asian America

MUS 126 Gender, Sexuality and Music in Cross Cultural Perspectives

MUS 127 Music Cultures of Southeast Asia

MUS 128 Performing Arts of Asia

MUS 129 Music Cultures of Africa

MUS 140 American Musical Subcultures: A Genealogy of Rock

MUS 146 Genealogy of Electronica

#### d) One course in musicology or composition/theory

#### e) Two courses outside the department; may use directed studies (MUS 290) for one.

#### f) Four units in one of the following ensembles:

MUS 168 Javanese Gamelan Ensemble

MUS 169 Japanese Taiko Ensemble

MUS 170 Filipino Rondalla Ensemble

MUS 174 Latin American Music Ensemble

MUS 175A Beginning Mariachi Music Ensemble

MUS 175B Intermediate Mariachi Music Ensemble

MUS 176 Bagpipe Ensemble

### 3. Musicology

#### a) Core requirements

MUS 200 Music Bibliography

MUS 201 Proseminar in the Analysis of Western Music

MUS 206 Proseminar in Musicology

MUS 207b Current Approaches in Ethnomusicology

#### b) Four courses in the 260s series:

MUS 262 Seminar in Western Music History

MUS 263 Seminar in Special Topics in Musicology

#### c) Two courses outside the Music Department; may use directed studies (MUS 290)

#### d) Two of the following courses:

MUS 118 Music, Politics and Social Movements

MUS 126 Gender, Sexuality and Music in Cross Cultural Perspectives

MUS 137 Seminar in Free Composition

MUS 153 Music and Homosexuality

MUS 207a The Development of Ethnomusicology

MUS 207b Current Approaches in Ethnomusicology

Music 265 Electroacoustic Music: History, Theory, and Aesthetics

MUS 255 Field Methods in Ethnomusicology

MUS 259 Music and Semiotics: Approaches to Meaning and Form

MUS 270 Special Topics in Ethnomusicology

**Thesis** Students whose degree objective is a terminal M.A. must write a thesis as part of the requirements for graduation. The M.A. thesis consists of an essay of substantial scope that makes an original contribution to the field. For digital composition students the thesis consists of two parts: a musical composition of substantial scope and a prose essay.

**Normative time to degree** 6 quarters

## Doctoral Program

The Department of Music offers the Ph.D. degree in Music. Students are invited by the faculty to continue toward candidacy for the Ph.D. degree on the basis of performance in courses and seminars, the quality of their portfolios, passing the comprehensive examination at the Ph.D. level, satisfactory completion of the M.A. requirements, and the recommendation of the faculty in their track (digital composition, musicology or ethnomusicology), in consultation with the graduate advisor.

Students with an M.A. degree from other universities are eligible for admission. The process of admission is the same as for students with a B.A.

### Requirements

#### 1. Foreign language requirement

Students must demonstrate a reading knowledge of a second foreign language, of use in scholarship within their discipline or chosen to support their research and creative interests. Musicology and ethnomusicology students with an M.A. from other universities who did not have to meet a foreign language requirement must demonstrate a reading knowledge of two foreign languages during their residency at UCR. Digital composition students are required to demonstrate a reading knowledge of one foreign language. PhD Digital Composition students entering UCR at the M.A. level must demonstrate a reading knowledge of two foreign languages.

#### 2. Coursework

Students continuing toward the PhD must take 36 additional units earned in seminars and in MUS 291 and MUS 299 studies geared toward preparation for the qualifying examinations.

Students entering with an M.A. from another institution must take a minimum of 48 units earned in seminars and directed studies (MUS 290). These must include the following required courses, although waiver may be granted for specific courses on an individual basis, depending on the student's prior graduate training and pending faculty approval. Students are encouraged to take additional seminars and MUS 291 and MUS 299 courses geared toward preparation for the qualifying examinations.

Ethnomusicology students must meet the course requirements of the M.A. as stated above.

Digital composition students are required to take:

- a) Core requirements
  - MUS 200 Music Bibliography
  - MUS 201 Proseminar in the Analysis of Western Music
  - MUS 206 Proseminar in Musicology or
  - MUS 207b Current Approaches in Ethnomusicology
  - MUS 256 Electroacoustic and Computer Music Composition
  - MUS 258 Graduate Composition Seminar (repeatable)
  - MUS 265 Electroacoustic Music: History, Theory, and Aesthetics
  - MUS 293 Composition Practicum (6 units)
- b) Two of the following repeatable courses:
  - MUS 232 Soundtrack Composition
  - MUS 249 Audiovisual and Multimedia Composition
  - MUS 251 Music in Computer Games
  - MUS 257 Music and Audio Production
  - MUS 259 Musical Semiotics: Approaches to Meaning and Form
  - MUS 264 Music in Fantasy and Science Fiction

Musicology students are required to take:

- a) Core requirements
  - MUS 200 Music Bibliography
  - MUS 201 Proseminar in the Analysis of Western Music
  - MUS 206 Proseminar in Musicology
  - MUS 207b Current Approaches in Ethnomusicology or MUS 255 Field Methods in Ethnomusicology
- b) Four courses in the 260s series:
  - MUS 262 Seminar in Western Music History
  - MUS 263 Seminar in Special Topics in Musicology

### 3. Qualifying examinations

Students must take the qualifying examinations, both written and oral, supervised by a faculty committee as stipulated in the regulations of the Graduate Division. The qualifying examinations concentrate on testing advanced skills and knowledge of specialized fields.

Digital composition students are also expected to pass a test containing ear-training, keyboard, and basic compositional skills. Qualifying examinations are normally taken in the ninth quarter for students entering with a B.A., and in the sixth quarter, for students entering with an M.A.

### 4. Dissertation prospectus

Students must write a dissertation prospectus as part of the written qualifying examinations.

#### Advancement to candidacy for the Ph.D. degree

Students advance to candidacy for the Ph.D. degree once they have passed all coursework and the written and oral qualifying examinations.

**Dissertation and final oral examination** A dissertation to be presented as prescribed by the Graduate Council is prepared under the direction of the candidate's dissertation committee. After completion of the dissertation, the candidate may be examined in its defense by the dissertation committee.

**Normative time to degree.** 15 quarters for students entering with a B.A. degree; 12 quarters for students entering with an M.A. degree.

*The descriptions of many courses listed below carry the phrase "or consent of instructor." This is meant to encourage musically qualified students who are not majors to participate in the courses and activities of the department. Any nonmajor having interest in a specific course should confer with the instructor about the qualifications for enrollment.*

## Lower-Division Courses

**MUS 001. Basic Musical Concepts (4)** Lecture, 3 hours; discussion, 1 hour. Fundamentals of music, including notation, rhythm, major and minor scales, intervals, tonality, triads. Includes ear training, sight singing, and elementary analysis. Designed for students who need basic musical literacy. Open to non-majors and those with no previous musical background.

**MUS 002. Introduction to Western Music (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of the major styles and genres of Western music. Emphasis on creative and analytical listening without the use of musical notation. Designed for the general student with an interest in music and cultural practice. No previous musical background required.

**MUS 003. Introduction to Opera (4)** Seminar, 3 hours; assigned listening, 3 hours. Explores social, political, gender-related, and moral issues represented in 10 major operas between the seventeenth and twentieth centuries. Introduces dramatic and musical structures of opera, value of performance, and operatic conventions shared by composers, singers, and audience.

**MUS 005. Women in Music (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey course designed primarily for nonmajors. Examines representative works by women composers from antiquity to the present.

**MUS 006. Introduction to World Music (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of people, identity, and music making. Includes listening to music from many cultural contexts. Also covers a variety of scholarly topics in world music. Cross-listed with ANTH 006.

**MUS 007. Music in Movies and TV (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An exploration of popular film and TV soundtrack music, emphasizing drama and musical style. Scene study features such films as *The Matrix*, *Casablanca*, *The X-Files*, and *Altered States*. Cross-listed with MCS 009.

#### MUS 008. Popular Music Cultures of the United States (4)

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Explores the so-called popular musics and music cultures of the United States and the social history of these cultures to provide students with a sonic understanding of these extremely fractured, ever reconstituted "United States."

**MUS 009. Introduction to Digital Music (4)** Lecture, 2 hours; workshop, 2 hours. Teaches basic theory and practical skills for understanding digital audio, recording, editing, and processing sound. Students work with audio and MIDI sequencers with the goal of writing musical compositions with computer notation programs.

**MUS 010. Advanced Fundamentals (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 001 or a passing score on an equivalent examination or consent of instructor. A study of advanced musical fundamentals.

**MUS 011. Interactive Digital Music and Multimedia Performance (4)** Lecture, 3 hours; individual study, 4 hours. An introduction to interactive digital music and multimedia performance. Includes development of individual and collaborative performance projects using sound, video, dance, and interactive technology. Requires a laptop and a license of the software Max/Msp/Jitter. No previous knowledge of music or technology required. Course is repeatable to a maximum of 12 units.

#### MUS 013. Popular Music Analysis: Text and Context (4)

Colloquium, 2 hours; seminar, 1 hour; workshop, 1 hour. Prerequisite(s): none. A textual and critical analysis of mass-mediated popular music. Explores theories of popular culture and traditional approaches from Western music theory as applied to the study of creation, interpretation, and reception of popular music.

**MUS 014. Popular Musics of the World (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to issues surrounding popular and urban musics of the world, focusing on three major geocultural areas: Africa, Asia, and the Americas. Emphasizes the relationship between mass-mediated music and issues of cultural hegemony, resistance, and subversion. Analyzes the cultural impact of media technology on music performance and reception. Cross-listed with ETST 014 and URST 014.

#### MUS 015. Latin American Folk and Popular Styles (4)

Lecture, 2 hours; discussion, 1 hour; assigned listening, 3 hours. Prerequisite(s): none. Introduction to the vast array of folk and popular styles of music in Latin America, with an emphasis on cultural and ethnic interaction and exchange in the context of Latin American history, politics, and society. Cross-listed with LNST 015.

#### MUS 016. Latin American Classical Heritage (4)

Lecture, 2 hours; discussion, 1 hour; assigned listening, 3 hours. Prerequisite(s): none. Survey of the rich heritage of Latin American classical music from Renaissance sacred polyphony to contemporary styles. Emphasis on the gradual emergence of Latin American music from European domination and the establishment of distinctive national traditions in the post-colonial era. Cross-listed with LNST 016.

#### MUS 017. Music of Mexico (4)

Lecture, 3 hours; discussion, 1 hour; assigned listening, 1 hour. Prerequisite(s): musical training and knowledge of Spanish is useful, but not required. Covers music from 1521 to the present day. Explores the rich musical tradition of Mexico, as well as the relationship between its art and popular music. Cross-listed with LNST 017.

**MUS 018. Music of Spain (4)** Lecture, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): none. A survey of Spanish music from the Middle Ages to the present. Covers regional folklore and popular styles (especially flamenco) as well as developments in classical music through the major style periods. Examines music in its historical and cultural context. Knowledge of Spanish and music not required.

**MUS 020. Music of Scotland (4)** Seminar, 3 hours; term paper, 1 hour; assigned listening, 2 hours. Examines the rich heritage of Scottish music from the Middle Ages to the modern day, including folk, popular, and classical traditions. Emphasis is on the music of the Scottish highlands and the bagpipe. Explores the role of music during war and peace within the context of Scottish history.

**MUS 030A. Harmony (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 010 or a passing score on an equivalent examination or consent of instructor; concurrent enrollment in MUS 031A or MUS 031B or MUS 031C or MUS 131A or MUS 131B or MUS 131C. The study of harmony through melodic and rhythmic practices.

**MUS 030B. Harmony (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 030A or consent of instructor; concurrent enrollment in MUS 031A or MUS 031B or MUS 031C or MUS 131A or MUS 131B or MUS 131C. Diatonic and chromatic harmony of the common practice period.

**MUS 030C. Harmony (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 030B or consent of instructor; concurrent enrollment in MUS 031A or MUS 031B or MUS 031C or MUS 131A or MUS 131B or MUS 131C. Diatonic and chromatic harmony of the common practice period.

**MUS 031A. Musicianship I (2)** Studio, 2 hours; discussion, 1 hour. Prerequisite(s): MUS 001 or MUS 010 or a passing score on an equivalent examination or consent of instructor. Covers melodic reading, rhythmic reading, and ear training. Includes basic keyboard harmony.

**MUS 031B. Musicianship I (2)** Studio, 2 hours; discussion, 1 hour. Prerequisite(s): MUS 031A or consent of instructor. Covers melodic reading, rhythmic reading, and ear training. Includes basic keyboard harmony.

**MUS 031C. Musicianship I (2)** Studio, 2 hours; discussion, 1 hour. Prerequisite(s): MUS 031B or consent of instructor. Covers melodic reading, rhythmic reading, and ear training. Includes basic keyboard harmony.

**MUS 073A. Dance of Mexico (2)** Studio, 3 hours; extra reading, 1 hour; screening, 1 hour; individual studio, 1 hour. Prerequisite(s): none. Covers the traditional dances of Mexico at the beginning level. Includes attendance at dance concerts outside of class. Recommended for both nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with LNST 073A.

**MUS 073B. Dance of Mexico (2)** Studio, 3 hours; extra reading, 1 hour; screening, 1 hour; individual studio, 1 hour. Prerequisite(s): LNST 073A/MUS 073A is recommended. Covers the traditional dances of Mexico at the beginning level. Includes attendance at dance concerts outside of class. Recommended for both nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with LNST 073B.

**MUS 080 (E-Z). Private Instruction: Voice, Keyboard, and Strings (1-2)** Studio, .5-1 hour; individual practice, 5-10 hours. Prerequisite(s): MUS 001 or equivalent; consent of instructor. Consists of a half- or one-hour lesson and practice for 5 to 10 hours each week (see the note regarding fees under the *Major Requirements* section). Offered as demand indicates. E. Voice; F. Classical Piano; G. Jazz Piano; I. Harpsichord; J. Carillon; K. Jazz Guitar; L. Electronic Bass Guitar; M. Lute; N. Classical Guitar; O. Viola da gamba; P. Piano Proficiency; Q. Organ; R. Violin; S. Viola; T. Violoncello; U. Double Bass Viol; V. Harp. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of performance before a jury or at a recital. Segments are repeatable.

**MUS 081 (E-Z). Private Instruction: Brass, Woodwinds, Percussion, and Other Instruments (1-2)** Studio, .5-1 hour; individual practice, 5-10 hours. Prerequisite(s): MUS 001 or equivalent; consent of instructor. Students take a half- or one-hour lesson and practice 5 to 10 hours each week (see the note regarding fees under the *Major Requirements* section). Offered as demand indicates. E. Trumpet; F. Trombone; G. Tuba; I. French Horn; J. Flute; K. Oboe; L. Clarinet; M. Bassoon; N. Saxophone; O. Recorder; P. Percussion; Q. Rondalla instruments; R. Bagpipe; S. Scottish Snare Drum; T. Tabla. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of performance before a jury or at a recital. Segments are repeatable.

## Upper-Division Courses

**MUS 112A. History of Western Music: Middle Ages to 1700 (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. An intensive survey of music history and literature from the Middle Ages to 1700. Involves score reading, listening, and analysis of pieces with emphasis on historical characteristics.

**MUS 112B. History of Western Music: 1700-1900 (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. An intensive survey of music history and literature from the 1700 to 1900. Involves score reading, listening, and analysis of pieces with emphasis on historical characteristics.

**MUS 112C. History of Western Music: Twentieth Century (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. An intensive survey of music history and literature from 1900 to the present. Involves score reading, listening, and analysis of pieces with emphasis on historical characteristics.

**MUS 113. Brazilian Music (4)** Lecture, 3 hours; extra reading, 2 hours; assigned listening, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduces the music of Brazil, focusing on the history and the current variety of musical languages, styles, and forms of the present. Analyzes the crucial question of national identity in Brazilian culture and society through the study of its music.

**MUS 114. Opera (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Study of selected operas from the Western repertory for 1600 to the present.

**MUS 115. Renaissance and Baroque Music of Latin Europe and Latin America (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 112A, MUS 112B, MUS 112C; or upper-division standing and consent of instructor. Study of the sacred and secular

musics of Italy, France, the Iberian Peninsula, and Latin America, 1450-1750. Emphasis is on the repertoires, styles, and genres that are relevant to understanding the musical past of the Americas, from (Alta) California to South America.

**MUS 116. Music of J. S. Bach (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical and analytical exploration of selected works by J. S. Bach. Usually devoted to specific genres within his output viewed in their musical and cultural context.

**MUS 117. Music and Ritual (4)** Lecture, 3 hours; written work, 1 hour; fieldwork, 20 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Examines music cross-culturally in a ritual context. Incorporates readings from ethnomusicology, anthropology, folklore, and performance studies. Addresses how music operates within specific ritual events and how it relates to cosmology. Also examines the role of music in achieving altered states (dreams, meditation, trance, and possession), as well as helping to constitute gendered authority.

**MUS 118. Music, Politics, and Social Movements (4)** Lecture, 3 hours; extra reading, 2 hours; assigned listening, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the role of music in social and political movements. Emphasis is on understanding the textual and musical features of politically engaged music within its historical, social, and cultural context.

**MUS 119. Javanese Music and Culture (4)** Lecture, 3 hours; term paper, 1 hour; online discussion and listening, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines Javanese traditional and contemporary music. Focuses on the music of the Javanese gamelan and its relation to larger cosmological themes. Other topics include rural versus court traditions, popular music, mass media, piracy, Hindu roots, modernity, and local practices versus global trends.

**MUS 120. Contemporary Native American Music (4)** Lecture, 3 hours; extra reading, 2 hours; listening to prepared audio examples of music, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the music of Native American peoples today, the contexts and behaviors with which such music is associated, and the ways these elements are discussed within Native communities. Emphasis is on "Pan Indian" music, including music for pow wows and syncretic religious music, and Native popular music, including folk, country, rock, and hip-hop.

**MUS 122. Music and Performance in the Andes (4)** Lecture, 3 hours; extra reading, 2 hours; assigned listening, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the musical practices of the central Andean countries, including indigenous, mestizo, Creole, and Afro-Andean traditions. Music is presented as part of a broader realm of performance in the Andes, incorporating dance, ritual, drama, and popular culture, and its relationship with notions of identity, nationalism, modernity, folklore, and politics.

**MUS 123. Southeast Asian Performance (4)** Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed both as a time-honored and as a contemporary medium for cultural production, from the courts to everyday experience. Material will be drawn from the Philippines, Malaysia, Indonesia, Thailand,

Laos, Cambodia, Vietnam, Burma, Singapore, and the Southeast Asian diaspora. Cross-listed with ANTH 126, AST 123, and DNCE 123.

**MUS 124. Music of Asian America (4)** Lecture, 3 hours; music listening, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores music as a window on the cultural politics of Asian America. Examines expressive culture as a constitutive site for ethnic identities and emergent political formations. Covers musics of Asian immigrants and of subsequent generations, including Asian American jazz and hip-hop. Cross-listed with AST 124.

**MUS 125. Music of Central America, Mexico, and the Caribbean (4)** Lecture, 3 hours; extra reading and listening to prepared tapes of music, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of different musical traditions from Central America, Mexico, and the Caribbean, with an emphasis on popular music. Examines the impact of intercultural contact on the musical styles of these regions. A background in Western music is not required.

**MUS 126. Gender, Sexuality, and Music in Cross-Cultural Perspectives (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of gendered performance genres from a number of cultures. Seeks to familiarize the student with gender-specific music and notions of gender that are often constructed, maintained, transmitted, and transformed through music and performance. Designed for students interested in music, anthropology, and gender studies. Cross-listed with ANTH 177 and WMST 126.

**MUS 127. Music Cultures of Southeast Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with ANTH 176, AST 127, DNCE 127, and ETST 172.

**MUS 128. Performing Arts of Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in four major geocultural regions of Asia: Central, East, South, and Southeast. No Western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with ANTH 128, AST 128, DNCE 128, and THEA 176.

**MUS 129. Music Cultures of Africa (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of African performance, addressing the large culture areas of the continent. Emphasizes African aesthetics. Special attention is paid to contemporary popular music, its roots in older genres, and its ongoing role in postcolonial politics. Cross-listed with ETST 118.

**MUS 130A. Counterpoint (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 138; concurrent enrollment in MUS 031A or MUS 031B or MUS 031C or MUS 131A or MUS 131B or MUS 131C. Study of contrapuntal techniques. Analysis of models centering on the sixteenth century, with exercises to develop manipulative skills in modal counterpoint.

**MUS 130B. Counterpoint (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): concurrent enrollment in MUS 031A or MUS 031B or MUS 031C or MUS

131A or MUS 131B or MUS 131C; MUS 130A. Study of contrapuntal techniques. Analysis of models centering on the eighteenth century, with exercises to develop manipulative skills in tonal counterpoint.

**MUS 131A. Musicianship II (1)** Laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): MUS 031C. Sight-singing and ear-training laboratory including keyboard harmony.

**MUS 131B. Musicianship II (1)** Laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): MUS 131A. Sight-singing and ear-training laboratory including keyboard harmony.

**MUS 131C. Musicianship II (1)** Laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): MUS 131B. Sight-singing and ear-training laboratory including keyboard harmony.

**MUS 133. Instrumentation (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. Investigation of the technical and color possibilities of various instruments, with scoring projects.

**MUS 134. Orchestration (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 133 or consent of instructor. Advanced scoring projects with emphasis on stylistic aspects and relationship of orchestral color to form.

**MUS 136. Jazz Theory (4)** Lecture, 3 hours; extra reading and listening to music tapes, 3 hours. Prerequisite(s): MUS 030A; MUS 031A or MUS 031B or MUS 031C; or consent of instructor. Examines concepts and practices in harmony, melody, rhythm, and form as they relate to jazz and other popular idioms. Provides basic ear training for the recognition of changes in traditional jazz tunes, primary blues forms, modulations, and classic jazz bridges.

**MUS 137. Composition Seminar (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. Assists in the successful composition of pieces in a variety of genres and media. Includes compositional models and the creation of musical scores. Course is repeatable to a maximum of 12 units.

**MUS 138. Form and Analysis in Western Music (4)** Lecture, 3 hours; assigned special projects, 3 hours. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. Different approaches to analysis using works in contrasting styles. Study of the dynamic design produced by the musical elements functioning in context.

**MUS 139. Sequencer Composition (4)** Lecture, 3 hours; individual study, 3 hours; extra reading, 3 hours. Prerequisite(s): MUS 030A or MUS 030B or MUS 030C (may be taken concurrently). Students learn music sequencing techniques in the context of the creation of an original piece of music. Topics covered include basic computer skills, benchmarking a digital orchestra, composing using a click track, and techniques of musical composition specific to the editorial potential inherent in music sequencing.

**MUS 140. American Musical Subcultures: A Genealogy of Rock (4)** Lecture, 3 hours; extra reading, 0-2 hours; listening, 2-3 hours. Prerequisite(s): upper-division standing or consent of instructor. A historical and cultural overview of the genre of American popular music known as "rock." Covers themes ranging from musical form and structure, aesthetics, and audio technology to community and individualism, gender and racial identity, political resistance, and the music industry. Cross-listed with HISA 139.

**MUS 145A. Digital Audio and Sound (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. College math is recommended. An introduction to the theory and practice of manipulating digital sound. Provides an understanding of digital audio devices associated with media production and of audio processing in general. Topics include basic psychoacoustics, digital audio theory, and digital audio editing.

**MUS 145B. Digital Audio and Sound (4)** Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): MUS 145A or theory proficiency and practical experience in digital audio. Advanced theory and practice of manipulating digital sound. Includes sound processing, synthesis, and composition, as well as multimedia and audiovisual composition and interactive media production. Provides an understanding of dedicated software for sound, music, and multimedia, including the programming environment Max/MSP. Course is repeatable to a maximum of 8 units.

**MUS 146. Genealogy of Electronica (4)** Lecture, 3 hours; term paper, 1 hour; online discussion and listening, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the history of electronica and electronic music. Focuses on particular issues, including youth culture, dance and ecstatic trance, subcultures and club cultures, hallucinogenic drugs and psychedelic aesthetics, globalization, audio piracy, media and audio technologies, music and politics, and gender and sexuality.

**MUS 150A. Instrumental Technique: Strings (2)** Lecture, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral string instruments.

**MUS 150B. Instrumental Technique: Woodwinds (2)** Lecture, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral woodwind instruments.

**MUS 150C. Instrumental Technique: Brass (2)** Lecture, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral brass instruments.

**MUS 150D. Instrumental Technique: Percussion (2)** Lecture, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral percussion instruments.

**MUS 151. Orchestral Conducting (4)** Lecture, 3 hours; studio, 2-3 hours. Prerequisite(s): consent of instructor. Fundamentals of baton technique, score study, transposition, and stylistic analysis as they relate to problems of conducting.

**MUS 152. Choral Conducting (4)** Lecture, 3 hours; studio, 2-3 hours. Prerequisite(s): consent of instructor. Study of choral repertoire, rehearsal methods, voice production, and techniques of conducting.

**MUS 153. Homosexuality and Music (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Uses a topical rather than a chronological approach to investigate homosexuality on the part of composers, performers, critics, theorists, and historians and how this has shaped the history of music in the West. Cross-listed with LGBS 153.

**MUS 154 (E-Z). Critical Approaches to the Western Canon (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 112A, MUS 112B, MUS 112C; or upper-division standing and consent of instructor. Critical study of selected repertoires within Western music, and the multiple and potentially problematic aspects of their construction as iconic and paradigmatic. E. Beethoven: The Music and the Myth.

**MUS 155 (E-Z). Seminar in Dance and Music (4)**

Seminar, 3 hours; term paper, 3 hours.

Prerequisite(s): upper-division standing or consent of instructor. Introduces relationships and representations between music and dance. Explores musical and choreographic form, compositional strategies, hybridization of style, cultural meanings and registers in which these were made, the agencies such representations enabled, interpretive communities, and cross-cultural interactions. Cross-listed with DNCE 155 (E-Z).

## Performance Courses 160-181

**MUS 160. Orchestra (1-2)** Studio, 2-6 hours.

Prerequisite(s): consent of instructor. Study and performance of standard orchestral literature. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. May be repeated for credit.

**MUS 161. Collegium Musicum (1-2)** Activity, 2-6 hours.

Prerequisite(s): consent of instructor. Study and performance of Medieval, Renaissance, and Baroque music. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. May be repeated for credit.

**MUS 162. Choral Society (1-2)** Studio, 2-6 hours.

Prerequisite(s): consent of instructor. Study and performance of standard choral literature. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. May be repeated for credit.

**MUS 163. Chamber Singers (1-2)** Studio, 2-6 hours.

Prerequisite(s): consent of instructor. Study and performance of works selected from different genres and periods. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**MUS 164. Jazz Ensemble (1-2)** Studio, 2-6 hours.

Prerequisite(s): consent of instructor. Study and performance of literature for large jazz ensemble and stage band, and preparation of improvised solos. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**MUS 165. Concert Band (1-2)** Studio, 2-6 hours.

Prerequisite(s): consent of instructor. Study and performance of literature for the concert band. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**MUS 166 (E-Z). Chamber Music (1-2)** Studio, 3-6 hours.

Prerequisite(s): admission by audition. Study and performance in varied small ensembles. E. Musical Instrument Digital Interface (MIDI) Ensemble; F. Improvisatory Ensemble; G. Chamber Music. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Segments are repeatable.

**MUS 167. Recital (1-2)** rehearsals, 6-12 hours.

Prerequisite(s): approval of music faculty; limited to advanced performers only. Preparation and presenta-

tion of a formal recital. Graded Satisfactory (S) or No Credit (NC).

**MUS 168. Javanese Gamelan Ensemble: Beginning (2)**

Studio, 6 hours. Prerequisite(s): upper-division standing and consent of instructor. Study and performance of the Central Javanese gamelan, consisting mainly of gongs and gong-chime instruments. Readings and discussions focus on Javanese culture. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with AST 168.

**MUS 169. Taiko Ensemble (1)** Studio, 2 hours.

Prerequisite(s): upper-division standing or consent of instructor. Study and performance of Japanese drumming. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with AST 169.

**MUS 170. Rondalla Ensemble (1-2)** Studio, 2-4 hours.

Prerequisite(s): upper-division standing or consent of instructor. Study and performance of the Filipino rondalla, an ensemble consisting of various sizes of lute-like and guitar-like instruments. Discussions focus on Filipino culture. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with AST 170.

**MUS 171. Gospel Choir (1-2)** Studio, 2-4 hours.

Prerequisite(s): upper-division standing or consent of instructor. Offers students practical performance experience in an ensemble as well as a background in different genres of gospel music ranging from the early 1900s to the present day. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**MUS 172. Chamber Orchestra (1)** Studio, 3 hours.

Prerequisite(s): upper-division standing or consent of instructor. Participation in a performance ensemble comprised mainly of strings, with occasional winds and horns as needed. Includes string techniques instruction. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 4 units.

**MUS 173. Music Recording (1-2)** Workshop, 2 hours;

studio, 2-4 hours. Prerequisite(s): consent of instructor. Introduces students to the practical aspects of classical music recording in a digital audio workstation, including miking, session organization, and subsequent editing and mastering. Students may sign up as either a performer or an engineer, with the instructor's permission. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of the nature of the project. Course is repeatable.

**MUS 174. Latin American Music Ensemble (1-2)**

Studio, 2-6 hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of select Latin American folk music traditions, with special emphasis on music of the Andean region. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work. Course is repeatable.

**MUS 175A. Beginning Mariachi Ensemble (1-2)** Studio, 3 hours; individual studio, 1-2 hours. Prerequisite(s):

upper-division standing or consent of instructor. A study and performance of selections from the Mexican folk music tradition. Emphasizes mariachi and son jarocho. Includes popular corridos and rancheras. Students who participate in a performance and submit a written review receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**MUS 175B. Intermediate Mariachi Ensemble (1-2)**

Studio, 3 hours; individual studio, 1-2. Prerequisite(s): MUS 175A or consent of instructor. A study and performance of selections from the Mexican folk music tradition. Emphasizes mariachi and son jarocho. Includes popular corridos and rancheras. Students who participate in a performance receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**MUS 176. Bagpipe Ensemble (1)** Studio, 2 hours.

Prerequisite(s): consent of instructor. Study and performance of Scottish bagpipe music. Students who participate in a performance receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**MUS 177. South Asian Music Ensemble (1-2)** Studio,

2-4 hours. Prerequisite(s): upper-division standing and consent of instructor. Explores the tradition of the Hindustani/North Indian tabla, which are a pair of drums that accompany improvised solos on melody instruments such as the sitar. Considers the tabla as a virtuosic solo instrument. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**MUS 180 (E-Z). Private Instruction: Voice, Keyboard, and Strings (2)** Studio, 1 hour; individual practice, 5-10 hours.

Prerequisite(s): upper-division or graduate standing in Music. Offered as demand indicates. E. Voice; F. Classical Piano; G. Jazz Piano; I. Harpsichord; J. Carillon; K. Jazz Guitar; L. Electric Bass Guitar; M. Lute; N. Classical Guitar; O. Viola da gamba; P. Piano Proficiency; Q. Organ; R. Violin; S. Viola; T. Violoncello; U. Double Bass Viol; V. Harp. Undergraduate students receive letter grades; graduate students receive Satisfactory (S) or No Credit (NC) grades. Segments are repeatable.

**MUS 181 (E-Z). Private Instruction: Brass, Woodwinds, Percussion, and Other Instruments (2)** Studio, 1 hour;

individual practice, 5-10 hours. Prerequisite(s): upper-division or graduate standing in Music. Offered as demand indicates. E. Trumpet; F. Trombone; G. Tuba; I. French Horn; J. Flute; K. Oboe; L. Clarinet; M. Bassoon; N. Saxophone; O. Recorder; P. Percussion; Q. Rondalla instruments; R. Bagpipe; S. Scottish Drums; T. Tabla. Undergraduate students receive letter grades; graduate students receive Satisfactory (S) or No Credit (NC) grades. Segments are repeatable.

**MUS 187. Improvisation Studies (4)** Seminar, 3 hours;

outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Presents the emergent field of improvisation studies, moving beyond traditional genre boundaries to explore improvisation as a cultural phenomenon and social practice. Draws from jazz studies, ethnomusicology, music theory, musicology, American studies, and the histories of dance, theatre, and the visual arts. Cross-listed with DNCE 187.

**MUS 190. Special Studies (1-5)** To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 12 units.

**MUS 191 (E-Z). Seminar in Music (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): MUS

112A, MUS 112B, MUS 112C; or consent of instructor. Topics dealing with aspects of individual composers and genre studies. F. Music of Beethoven; H. Construction of Early Instruments; I. Performance Practice; J. Music of Haydn; K. Interpretation of Symphonic Literature; M. Russian Romantic Music; N. Early American Music; O. Music of Mozart; R. Survey of Sonatas from the Seventeenth through the Twentieth Centuries; S. The Evolution and Practice of Jazz; U. Music Criticism; V. Studies in Twentieth-Century Music.

**MUS 194. Independent Reading (1-2)** Prerequisite(s): junior standing. Independent reading in materials not covered in course work. Normally begun in the junior year. May be repeated for credit. Total credit for course 194 may not exceed 4 units.

**MUS 195. Senior Thesis (1-4)** Required for students who are candidates for honors in music. Open to other music majors by invitation. Total credit may not exceed 6 units.

**MUS 198-I. Individual Internship (1-12)** variable hours. Prerequisite(s): upper-division standing; evidence of prior arrangements with the professional(s) involved; approval by the department chair after consulting the music faculty. Work with an appropriate professional individual or organization to gain experience and skill in the student's chosen specialty. Graded Satisfactory (S) or No Credit (NC). May be repeated to a total of 16 units.

**MUS 199H. Senior Honors Research (1-5)**

## Graduate Courses

**MUS 200. Music Bibliography (4)** Seminar, 3 hours; outside research, 1 hour. Fundamentals of music bibliography. Emphasis on reference materials and other standard bibliographical tools.

**MUS 201. Proseminar in the Analysis of Western Music (4)** Seminar, 3 hours; individual guided research, 3 hours. Prerequisite(s): graduate standing. Analysis of selected musical works from various periods exploring different music-theory models.

**MUS 206. Proseminar in Musicology (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 200. Study of significant issues and recent developments in musicology and criticism. Study and practice of expository writing about music.

**MUS 207A. Proseminar in Ethnomusicology: History and Foundations (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Explores the early history of ethnomusicology as a discipline. Includes its foundation in comparative musicology and its connections with folklore.

**MUS 207B. Proseminar in Ethnomusicology: Current Theoretical Directions (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Explores ethnomusicology as a discipline. Focuses on the relationships between ethnomusicology and musicology, and on ethnomusicology as an interdisciplinary field. Draws from performance studies, ethno-poetics, postmodernism, translational theories, and postcolonialism.

**MUS 232. Soundtrack Composition (3)** Lecture, 3 hours; individual study, 1 hour. Prerequisite(s): MUS 145A or MUS 145B or consent of instructor; graduate standing or both upper-division standing and keyboard proficiency. Concerns musical composition for visual art and entertainment. Covers classic underscoring for dramatic effect, experimentation with music use in film and live-scripted situations, and composition of a musical piece. May be taken

Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**MUS 249. Audiovisual and Multimedia Composition (4)** Lecture, 3 hours; individual study, 4 hours.

Prerequisite(s): graduate standing. Explores new fields of artistic creativity emerging from the convergence of sound and image. Focuses on audiovisual and multimedia composition, as well as on the collaboration process embracing research, composition, and performance. Encourages exploration of the links among sound, image space, environment, and digital media. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**MUS 251. Music in Computer Gaming (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to the history and theory of music use in computer games, including the development of classical commercial gaming and game design and the related use of dramatic music. Topics cover adventure game history, narrative underscoring, commercial computer game genres, and contemporary issues related to interactivity, performance, and reception.

**MUS 252. Notation for Composers (4)** Lecture, 3 hours; individual study, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Combines a critical study of notation history and survey of contemporary techniques for the conceptualization and display of visual information with computer-oriented musical applications. Includes common practice computer music notation, graphics software, and the translation of data between music software. Students advanced to candidacy for the Ph.D. receive a Satisfactory (S) or No Credit (NC) grade.

**MUS 255. Field Methods in Ethnomusicology (4)** Seminar, 3 hours; outside research, 1 hour; field, 2 hours. Prerequisite(s): graduate standing. A theoretical and practical introduction to fieldwork in music and performance. Each student focuses on a different performance group and documents its activities. Covers interviewing, audiotaping, videotaping, transcribing music and dance, and describing performance events.

**MUS 256. Electroacoustic and Computer Music Composition (4)** Seminar, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor; MATH 004 or equivalent is recommended. Covers electroacoustic and computer music composition techniques in the context of development of original pieces. Topics include electronic and computer music history and theory, as well as digital audio and sound processing theory (including synthesis techniques and real-time sound processing and instrument design).

**MUS 257. Music and Audio Production (4)** Lecture, 3 hours; studio, 8 hours per quarter; individual study, 3 hours. Prerequisite(s): MUS 145A; MUS 145B or consent of instructor. Addresses techniques of commercial music production, including recording, editing, sequencing, notation preparation, and sound reinforcement. Combines an examination of the history of commercial sound aesthetics with structured exercises in producing, including software benchmarking, project management, budgeting, audio devices, mastering, and design for sound reinforcement and miking. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

**MUS 258. Composition Seminar (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Individual projects and issues in musical composition. Course is repeatable.

**MUS 259. Musical Semiotics: Approaches to Meaning and Form (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Study of musical semiotics focusing on recent theories and related areas such as cybernetics, cognitive science, and theory of systems. Examines questions of meaning and form in the domains of aesthetics, musical theory, analysis, composition, performance, and new approaches of digital media and music.

**MUS 261. Seminar in Performance Practice (4)** Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 200 and MUS 201, or consent of instructor. Investigations into the historically accurate performance styles of music based on information contemporary with the music. Topics and content will vary each quarter depending on student interest. May be repeated for up to 8 units.

**MUS 262. Seminar in Western Music History (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 206, graduate standing; or consent of instructor. Addresses selected issues in the history of music in the context of the social, political, religious, and intellectual culture of the West. Focuses on historical and analytical literature on particular historical periods. Course is repeatable as topics change.

**MUS 263. Seminar in Special Topics in Musicology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MUS 206, graduate standing; or consent of instructor. Focuses on current scholarship in musicology and related fields with a strong critical content. Addresses particular topics relative to their historical and stylistic periods. Topics include nationalism, gender and sexuality in music, identity in music, individual genres and composers, and exoticism. Course is repeatable.

**MUS 264. Music in Fantasy and Science Fiction (4)** Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the use of music in science fiction and fantasy. Covers Tales of Hoffman and Anansi to Star Trek and Solaris. Examines music's textural, sonic, and political roles in terms of traditional functions, as well as those associated with the explication of the synthetic and fantastic.

**MUS 265. Electroacoustic Music: History, Theory, and Aesthetics (3)** Lecture, 3 hours; individual study, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Focuses on historical, theoretical, and esthetic issues of electroacoustic music from the beginning of the twentieth century to the present. Topics include foundations of electroacoustic music, electronic music studios, analog and digital technology, sound art, and live-electronics. Includes listening to and analysis of key works of electroacoustic music.

**MUS 270. Special Topics in Ethnomusicology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on current scholarship in ethnomusicology and related fields. Emphasis is usually on theory and methodology or the study of particular regions or performance traditions. Theme varies each quarter. Course is repeatable to a maximum of 8 units.

**MUS 271. Area Studies Research in Music (4)** Seminar, 3 hours; extra reading, 2 hours; listening, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Focuses on historical and ethnographic literature of particular geographical areas. Discusses scholarly literature on music (and expressive culture generally, including dance, theater, and ritual) of a particular geocultural region. Course is repeatable as topics change to a maximum of 8 units.

**MUS 290. Directed Studies (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MUS 291. Individual Study in Coordinated Areas (1-6)** Individual study, 6-25 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. A program of study designed to assist graduate candidates who are preparing for M.A. comprehensive or Ph.D. qualifying examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**MUS 292. Concurrent Analytical Studies in Music (1-4)** Prerequisite(s): graduate standing; approval of instructor and graduate advisor. Each 292 course will be taken concurrently with some 100-series course but on an individual basis. It will be devoted to research, criticism, and written work of a graduate order commensurate with the number of units elected. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**MUS 293. Composition Practicum (1)** Lecture, 1 hour; practicum, 8 hours per quarter; individual study, 3 hours; studio, 16 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. A series of performance activities and appreciation for composers. Includes production of a composition concert and attendance at designated presentations in music and scholarship. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes.

**MUS 297. Directed Research (1-6)** Prerequisite(s): graduate status and consent of instructor and graduate advisor. Individual graduate student research under the sponsorship of specific faculty members, on topics and selected problems in theoretical and historical research in music not directly related to student's thesis. Graded Satisfactory (S) or No Credit (NC).

**MUS 299. Research for Thesis or Dissertation (1-12)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**MUS 301. Directed Studies in the Teaching of Music (3)** Seminar, 2 hours; consultation, 1 hour. Prerequisite(s): graduate standing. A program of weekly meetings and individual formative evaluation required of new Music teaching assistants. Covers instructional methods and classroom/section activities. Conducted by department faculty. Graded Satisfactory (S) or No Credit (NC).

**MUS 302. Teaching Practicum (1-4)** Clinic, 1 hour; practicum, 1 hour; lecture, 2 hours. Prerequisite(s): appointment as a teaching assistant in Music; graduate standing. Supervised teaching in undergraduate Music courses. Required of all Music teaching assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

# Natural and Agricultural Sciences

**Subject abbreviation: NASC**  
**College of Natural and Agricultural Sciences**

## Lower-Division Courses

**NASC 091. Freshman Advising Seminar in the Natural and Agricultural Sciences (1)** Seminar, 1 hour. Prerequisite(s): first-year freshman standing in the

College of Natural and Agricultural Sciences (CNAS). Introduction to UCR for students in the sciences. Includes selection of majors, curriculum planning, career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty in CNAS. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of BCH 095, NASC 091, or NASC 093.

**NASC 092. First-Year Seminar in the Natural and Agricultural Sciences (1)** Seminar, 10-15 hours per quarter. Prerequisite(s): Freshman standing. Enrollment priority is given to freshmen, but sophomores may enroll on a space-available basis with consent of instructor. Introduction to one of the many areas of study explored by the faculty of natural and agricultural sciences in a small-group, highly interactive format. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 3 units of any combination of ENGR 092, HASS 092, and NASC 092; students may enroll in only 1 unit of ENGR 092, HASS 092, or NASC 092 per quarter.

**NASC 093. Freshman Advising Seminar in the Natural and Agricultural Sciences (2)** Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): first-year freshman standing in the College of Natural and Agricultural Sciences (CNAS). Introduction to UCR for students in the sciences. Includes selection of majors, curriculum planning, career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty and professional academic advisors in CNAS. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of BCH 095, NASC 091, or NASC 093.

## Upper-Division Courses

**NASC 191S. Seminar in Sacramento (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Center at Sacramento Program. Examines aspects of the Sacramento area, including cultural, political, and governmental institutions and the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Sacramento. Required of participants in the UCR Center at Sacramento Program. Cross-listed with ENGR 191S and HASS 191S.

**NASC 191W. Seminar in Washington, D.C. (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Washington Center Program. Examines aspects of the Washington, D.C., area, including cultural, political, and governmental institutions as well as the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Washington, D.C. Required of participants in the UCR Washington, D.C., Center Program. Cross-listed with ENGR 191W and HASS 191W.

**NASC 192. Careers in Science and Mathematics Education (1)** Seminar, 1 hour. Prerequisite(s): upper-division standing or consent of instructor; consent of instructor is required for students repeating the course. Covers preparation for a career in mathematics and science teaching. Includes job search strategies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

**NASC 198-I. Individual Internship in the Natural and Agricultural Sciences (1-12)** Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): upper-division standing in the College of Natural and Agricultural Sciences (CNAS); consent of instructor. An internship to provide CNAS students with on-the-job experience in government, industry, or clinical laboratories. Each individual project must be approved by the CNAS associate dean and the laboratory director where the internship is to be carried out. Requires a written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

# Nematology

**Subject abbreviation: NEM**  
**College of Natural and Agricultural Sciences**

Philip A. Roberts, Ph.D., Chair  
Department Office, 2317 Webber Hall  
(951) 827-2583  
[www.nematology.ucr.edu](http://www.nematology.ucr.edu)

### Professors

James G. Baldwin, Ph.D.  
Isgouhi Kaloshian, Ph.D.  
Philip A. Roberts, Ph.D.

### Professors Emeriti

Reinhold Mankau, Ph.D.  
Edward G. Platzer, Ph.D. (Nematology/Biology)  
Seymour D. Van Gundy, Ph.D.  
(Nematology/Plant Pathology)

### Associate Professor

Paul De Ley, Ph.D.

\*\*

### Lecturers

J. Ole Becker, Ph.D.  
Michael V. McKenry, Ph.D.  
Antoon T. Ploeg, Ph.D.

### Affiliated Faculty

John D. Radewald, Ph.D. (Agronomist Emeritus)

### Cooperating Faculty

Bradley C. Hyman, Ph.D. (Biology)  
Morris F. Maduro, Ph.D. (Biology)

Nematology is the study of roundworms, the most genetically diverse invertebrate phylum that occurs worldwide in virtually every environment. Only about 3 percent of all species have been studied or identified, and these include significant parasites of humans, animals, and plants. A primary mission of the Department of Nematology is to develop environmentally sound approaches to manage nematodes that worldwide cause nearly \$100 billion annual damage to crops. Other objectives are to use nematodes that benefit agriculture and the environment as agents of nutrient cycling and soil fertility and for biological control of some insect pests. Additional objectives focus on nematodes as fundamental models for addressing basic biological questions in genetics, development, and molecular biology. The department offers graduate and postgraduate opportunities in biocontrol, ecology, genetics, molecular biology, physiology, and systematics. It offers specific expertise in applied nematode problems of subtropical and desert agriculture.

A graduate program in Nematology is offered within a broad biological context. Students are enrolled in a more general department or interdepartmental program that provides a core of graduate courses. The general departments may include Biology, Botany and Plant Sciences, Entomology, Plant Pathology and Microbiology, and Environmental Sciences as well as a wide range of interdepartmental programs. Dissertation research opportunities, major research professor, curriculum advisor, and specific courses are provided by the Department of Nematology to complement requirements of the more general department or program.

## Upper-Division Courses

**NEM 120. Soil Ecology (3)** Lecture, 3 hours. Prerequisite(s): BIOL 002 or both BIOL 005A and BIOL 05LA; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC. Examination of soil biota and their relationships with plants and the soil environment. Emphasis is on soil biotic interactions that influence soil fertility, plant disease, and plant growth. Examines the importance of the different microbial and faunal groups from the rhizosphere to the ecosystem level. Cross-listed with ENSC 120 and SWSC 120. **Crowley, DeLey**

**NEM 159. Biology of Nematodes (3) W** Lecture, 2 hours; discussion and demonstration, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics. An introduction to the biology of nematodes. Topics include the morphology, physiology, development, genetics, behavior, and ecology of nematodes from parasitic and free-living habitats. In the discussion and demonstration section, students observe the comparative morphology and biology of nematodes and give oral presentations on selected nematode life histories. Cross-listed with BIOL 159. **Baldwin, Platzer**

**NEM 190. Special Studies (1-4)** Individual study, 3-12 hours. Prerequisite(s): consent of instructor and Department Chair. Individual study, directed by a faculty member, to meet special curricular needs. A written report is required. Course is repeatable.

**NEM 197. Research for Undergraduates (1-4)** Laboratory, 3-12 hours. Prerequisite(s): upper-division standing. Research in nematology with the guidance of a Nematology faculty member. A written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**NEM 199. Senior Research (2-4) F, W, S** Laboratory, 6-12 hours. Prerequisite(s): senior standing, a grade of "B+" or better in an upper-division Biology course, a grade of "B+" or better in an upper-division Nematology course; or consent of instructor. Individual research on a problem relating to Nematology. A written proposal signed by the supervising faculty member must be approved by the major advisor and the department chair and a written report filed with the supervising faculty member. Course is repeatable to a maximum of 9 units.

## Graduate Courses

**NEM 205. Identification of Plant Parasitic Nematodes (1) Summer (one week only)** Lecture, 5 hours; laboratory, 25 hours. Prerequisite(s): graduate standing or consent of instructor. Five-day lecture and

laboratory course on morphological identification of economically important plant parasitic nematodes in *Tylenchida* and *Dorylaimida* using dissecting and bright field microscopy. Includes preparation of microscope slides, diagnosis of field samples, and use of diagnostic keys. Offered in summer only. **Baldwin**

**NEM 206. Phytopathogens: Nematodes (2) S** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Recognition, diagnosis, biology, and control of major nematode diseases of plants. Laboratory covers identification techniques, soil sampling and processing techniques, and process of pathogenesis. Cross-listed with PLPA 206. **Roberts**

**NEM 250. Seminar in Nematology (1)** Seminar, 1 hour. Prerequisite(s): consent of instructor. Lectures and discussions by visiting scientists, staff and graduate students on topics in nematology. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition instructor for a letter grade on the basis of presentation of a formal seminar.

**NEM 270. Special Topics in Nematology (1)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of current literature within special areas of nematology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**NEM 290. Directed Studies (1-6)** Individual studies on specially selected topics in nematology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**NEM 297. Directed Research (1-6)** Experimental studies on specially selected topics in nematology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC).

## Neuroscience Undergraduate Major

**Subject abbreviation: CBNS**

**College of Humanities, Arts, and Social Sciences  
College of Natural and Agricultural Sciences**

Peter Hickmott, Ph.D., Chair

College of Humanities, Arts, and Social Sciences  
2111H Psychology; (951) 827-7308

College of Natural and Agricultural Sciences  
1223 Pierce Hall; (951) 827-7294  
[neuromajor.ucr.edu](http://neuromajor.ucr.edu)

### Committee in Charge

Michael Adams (Cell Biology & Neuroscience, Entomology)

Margarita Currás-Collazo (Cell Biology & Neuroscience)

Scott Currie (Cell Biology & Neuroscience)

Todd Fiacco (Cell Biology & Neuroscience)

Peter Hickmott (Psychology)

Kelly Huffman (Psychology)

Edward Korzus (Psychology)

Khaleel Razak (Psychology)

B. Glenn Stanley (Cell Biology & Neuroscience)

Stephen E. Cullenberg, Ph.D.

*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

Thomas Baldwin, Ph.D.

*Dean, College of Natural*

*and Agricultural Sciences, ex officio*

## Major

The Neuroscience major is an intercollege major offered by the colleges of Humanities, Arts, and Social Sciences and Natural and Agricultural Sciences. It offers upper-division courses that contribute to an academic program emphasizing the functioning of nervous systems at the molecular, cellular, system, behavioral, and cognitive levels. Some of the topics covered include neuroanatomy, neurophysiology, and neurochemistry in humans and other animals; neural mechanisms underlying sensory system function and perception; neural organization of behavior; development of the nervous system; and neural mechanisms of learning and memory.

Both a B.A. and a B.S. degree are offered by each college. When students declare the major, they choose from which college they wish to have their degree awarded. Students whose degrees are awarded by the College of Humanities, Arts, and Social Sciences are advised in and have their records maintained by the Department of Psychology; students whose degrees are awarded by the College of Natural and Agricultural Sciences are advised in and have their records maintained by the CNAS Academic Advising Center. Breadth requirements vary by college; and students must fulfill the breadth requirements of the college they choose.

For information about student advising, contact the CNAS Academic Advising Center, (951) 827-7294, or the Department of Psychology, (951) 827-5386, University of California, Riverside, Riverside, CA 92521.

## University Requirements

See Undergraduate Studies section.

## College Requirements

College breadth requirements vary depending on which college is chosen to award the degree. For details on breadth requirements, see the Colleges and Programs section of this catalog. Students are urged to consult their advisor regarding requirements.

The following restrictions and additions apply to college breadth requirements for the Neuroscience major.

### For the College of Humanities, Arts, and Social Sciences

**Humanities** Foreign language at level 4 or above for the B.A. may be used to fulfill up to 8 units of the Humanities breadth requirement.

**Social Sciences** Psychology courses may not be used as part of the Social Sciences breadth requirement if a Biology course is used to meet any part of the Natural Sciences and Mathematics breadth requirement.

**Foreign Language** In fulfilling the Foreign Language breadth requirement for both the B.A. and B.S. degrees, a modern language such as Spanish, Russian, Chinese, German, or French must be used.

**Natural Sciences and Mathematics**

The Neuroscience Core in the Neuroscience major satisfies the Natural Sciences and Mathematics breadth requirement.

**For the College of Natural and Agricultural Sciences**

**Humanities** For the B.S. degree, 16 units instead of 12 units are required to fulfill the Humanities breadth requirement. PHIL 134 and PHIL 137 are recommended.

**Social Sciences** For the B.S. degree, 16 units instead of 12 units are required to fulfill the Social Sciences breadth requirement. Psychology courses not required or approved for the Neuroscience major may be used in meeting the Social Sciences breadth requirement.

**Foreign Language** In fulfilling the Foreign Language breadth requirement for the B.A. degree, a modern language such as Spanish, Russian, Chinese, German, or French must be used. Further, fourth-quarter level proficiency in one foreign language (not level 2 in two languages) is required.

**Natural Sciences and Mathematics** The Neuroscience Core in the Neuroscience major satisfies the Natural Sciences and Mathematics breadth requirement.

**Major Requirements**

1. Neuroscience Core (66-72 units; satisfies the Life Sciences Core required for some majors in the College of Natural and Agricultural Sciences). Up to 12 units of upper-division life sciences courses (for this major, courses from the departments of Biochemistry, Biology, Cell Biology and Neuroscience, and Entomology) not being used to satisfy the core may be taken prior to completion of the core; permission from the program chair or the program chair's designate is required to take upper-division units in excess of these 12 units.

a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C (BIOL 002 and BIOL 003 may be substituted for BIOL 005A, BIOL 05LA, and BIOL 005B with advisor's approval.)

b) PSYC 011 or STAT 040 or STAT 100A

c) MATH 008B or MATH 009A or MATH 09HA; and MATH 009B or MATH 09HB

d) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC); CHEM 112A, CHEM 112B, CHEM 112C

e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC; or PHYS 040A, PHYS 040B, PHYS 040C

f) BCH 100 or BCH 110A

2. Upper-division requirements

a) First Tier (14 units)

(1) CBNS 106 with a grade of C- or better

(2) CBNS 120/PSYC 120

(3) CBNS 120L/PSYC 120L or CBNS 130L

(4) CBNS 124/PSYC 124

b) Second Tier (at least 12 units for the B.A. or at least 20 units for the B.S.)

BIOL 178; CBNS 101, CBNS 116, CBNS 121/PSYC 121, CBNS 123, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127; PSYC 112, PSYC 117, PSYC 129

c) Third Tier (additional units to reach a total of 36 units for the B.A. or 52 units for the B.S.)

Select from upper-division courses listed under Neuroscience Core, Second Tier above not used to satisfy those requirements, and the additional courses listed below. The combined number of units taken under First Tier, Second Tier, and Third Tier must total either 36 if the B.A. is sought or 52 if the B.S. is sought.

BCH 102, BCH 110B, BCH 110C, BCH 120; BIOL 100/ENTM 100, BIOL 102, BIOL 105, BIOL 107A, BIOL 108, BIOL 109, BIOL 110, BIOL 151, BIOL 160, BIOL 161A, BIOL 161B; BIOL 162/ENTM 162; BIOL 171, BIOL 171L, BIOL 173/ENTM 173, BIOL 175, BIOL 185P; CBNS 108, CBNS 150, CBNS 165, CBNS 169; up to 9 units from CBNS 194, CBNS 197 and/or CBNS 199; CS 170; PHYS 139L; PSYC 115, PSYC 130, PSYC 132, PSYC 134, PSYC 135, ANTH 146/PSYC 146

**Note** No courses other than those listed may be used in the major unless specifically approved by the program chair or the program chair's designate.

**Sample Program Bachelor of Arts**

Freshman Year	Fall	Winter	Spring
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC	4,1	4,1	4,1
BIOL 005A, BIOL 05LA; BIOL 005B		3,1	4
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4
MATH 008B or MATH 009A, MATH 009B	4	4	
Humanities/Social Sciences			4
<b>Total Units</b>	<b>13</b>	<b>17</b>	<b>17</b>

Sophomore Year	Fall	Winter	Spring
CHEM 112A, CHEM 112B, CHEM 112C	4	4	4
BIOL 005C	4		
CBNS 106	4		
PSYC 001, PSYC 002	4	4	4
General Physics	4	4	4
General Physics Lab	1	1	1
Foreign Language	1, 2	4	4
<b>Total Units</b>	<b>17</b>	<b>17</b>	<b>17</b>

Junior Year	Fall	Winter	Spring
BCH 100 or BCH 110A	4		
PSYC 011	5		
Upper-division BIOL, CBNS, or PSYC	4	8	8
Foreign Language	3, 4	4	4
Humanities/Social Sciences		4	4
<b>Total Units</b>	<b>17</b>	<b>16</b>	<b>12</b>

Senior Year	Fall	Winter	Spring
Upper-division BIOL, CBNS, or PSYC	4	4	4
Humanities/Social Sciences	8	4	4
Electives	4	8	8
<b>Total Units</b>	<b>16</b>	<b>16</b>	<b>16</b>

**Bachelor of Science**

Freshman Year	Fall	Winter	Spring
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC	4,1	4,1	4,1
MATH 008B or MATH 009A, MATH 009B	4	4	
BIOL 005A, BIOL 05LA; BIOL 005B		3,1	4
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4
Humanities/Social Sciences			4
<b>Total Units</b>	<b>13</b>	<b>17</b>	<b>17</b>

Sophomore Year	Fall	Winter	Spring
CHEM 112A, CHEM 112B, CHEM 112C	4	4	4
BIOL 005C	4		
CBNS 106	4		
PSYC 001, PSYC 002		4	4
General Physics	4	4	4
General Physics Lab	1	1	1
Humanities/Social Sciences		4	4
<b>Total Units</b>	<b>17</b>	<b>17</b>	<b>17</b>

Junior Year	Fall	Winter	Spring
BCH 100 or BCH 110A	4		
PSYC 011	5		
Upper-division BIOL, CBNS, or PSYC	4	8	8
Humanities/Social Sciences	4	8	4
<b>Total Units</b>	<b>17</b>	<b>16</b>	<b>12</b>

Senior Year	Fall	Winter	Spring
Upper-division BIOL, CBNS, or PSYC	12	8	8
Electives	4	8	8
<b>Total Units</b>	<b>16</b>	<b>16</b>	<b>16</b>

**Minor**

A minor in Neuroscience is available. For more information on minor requirements, refer to the discussion of minors in the appropriate college section of the General Catalog.

1. First tier (14 units)

a) CBNS 106 with a grade of C- or better

b) CBNS 120/PSYC 120

c) CBNS 120L/PSYC 120L or CBNS 130L

d) CBNS 124/PSYC 124

2. Second Tier (6 units)

Select additional units from the list below so that the units from the First Tier combined with the units from the Second Tier equal at least 20.

BIOL 178; CBNS 101, CBNS 116, CBNS 121/PSYC 121, CBNS 123, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127; PSYC 112, PSYC 117, PSYC 129

Descriptions for all courses used in the Neuroscience major and minor may be found in the appropriate department section.

# Neuroscience Graduate Program

**Subject abbreviation: NRSC**  
**College of Natural and Agricultural Sciences**

Michael E. Adams, Ph.D., Director  
Program Office, 1140 Batchelor Hall North  
(951) 827-4716; (800) 735-0717  
[neuro.ucr.edu](http://neuro.ucr.edu)

## Professors

Michael E. Adams, Ph.D.  
(Cell Biology and Neuroscience/Entomology)  
John Andersen, Ph.D. (Psychology)  
Curt Burgess, Ph.D. (Psychology)  
Christine Chiarello, Ph.D. (Psychology)  
Theodore Garland, Jr., Ph.D. (Biology)  
Manuela Martins-Green, Ph.D.  
(Cell Biology and Neuroscience)  
Thomas H. Morton, Ph.D. (Chemistry)  
B. Glenn Stanley, Ph.D.  
(Cell Biology and Neuroscience/Psychology)  
Raphael Zidovetzki, Ph.D.  
(Cell Biology and Neuroscience)

## Associate Professors

Maxim Bazhenov, Ph.D. (Cell Biology and Neuroscience)  
Monica J. Carson, Ph.D. (Biomedical Sciences)  
Margarita C. Currás-Collazo, Ph.D.  
(Cell Biology and Neuroscience)  
Scott N. Currie, Ph.D.  
(Cell Biology and Neuroscience)  
Iryna M. Ethell, Ph.D. (Biomedical Sciences)  
Peter W. Hickmott, Ph.D. (Psychology)  
Wendy G. Saltzman, Ph.D. (Biology)

## Assistant Professors

Devin Binder, M.D., Ph.D. (Biomedical Sciences)  
Anupama Dahanukar, Ph.D. (Entomology)  
Todd Fiacco, Ph.D. (Cell Biology and Neuroscience)  
Kelly J. Huffman, Ph.D. (Psychology)  
Edward Korzus, Ph.D. (Psychology)  
Sara Mednick, Ph.D. (Psychology)  
Anandasankar Ray, Ph.D. (Entomology)  
Khaleel Razak, Ph.D. (Psychology)  
Aaron Seitz, Ph.D. (Psychology)  
Emma Wilson, Ph.D. (Biomedical Sciences)

## Adjunct Professor

Andre Obenaus, Ph.D.

# Graduate Program

The multidisciplinary interdepartmental graduate program in Neuroscience offers instruction and research training leading to the Ph.D. degree in Neuroscience. A Thesis Plan (Plan I) or Non-Thesis Plan (Plan II) M.S. degree in Neuroscience is available under special circumstances, when the work leading to the Ph.D. degree cannot be completed. Whether either of these options is appropriate will be decided by the student's Guidance Committee typically either at the end of the first year, or at the time of the qualifying

examination. See General University requirements for Plan I and Plan II M.S. degrees:  
<http://graduate.ucr.edu/masters.html>.

The goal of this program is to prepare students for careers in research, teaching and scientific administration. The program is aimed at providing high-quality graduate training for students who come from a variety of undergraduate backgrounds but share a commitment and an intense interest in nervous system research. Students are expected to learn the fundamentals of neuroscience, starting with a required core sequence, become knowledgeable concerning a range of research methods as taught in neuroscience laboratories and demonstrate capability in original research. Graduate student training reflects the research competence and specialties of the faculty. That is, the specific research training received by a graduate student is the responsibility of the major professor/mentor in whose laboratory the student carries out the research projects leading to the degree. Students benefit from an interdisciplinary training approach, tailored by the major advisor but enriched by the readily available expertise and laboratory facilities of program faculty with backgrounds ranging from chemistry to psychology.

Current UCR Neuroscience faculty have major appointments in several different departments but have a considerable degree of common interest in research problems and techniques. Furthermore, the three chief levels of analysis at which nervous systems are currently studied (molecular/cellular, systems, and behavioral) are more or less evenly represented by the interests and expertise of the faculty. Some faculty, as may be expected, carry out research programs that combine two or more of these levels of analysis. These levels of analysis, which characterize the faculty's research, indicate the breadth of integrated neuroscience at UCR but do not represent "fields of emphasis" in which students are to be trained.

Areas that faculty investigate include the following:

- Glial–neuron interactions
- Physiological actions of ion channel toxins
- Modulation of ion channels by neurotransmitters and hormones
- Auditory processing
- Synaptic transmission and neural plasticity in mammalian nervous systems
- Signal transduction in excitable cells
- Sensory and perceptual processes
- Molecular biology of ion channel structure and function
- Receptor–channel interactions
- Function of ligand-gated ion channels in neurons
- Influence of specific receptor proteins on function
- Synaptic and non-synaptic mechanisms in neuroendocrine systems
- Plasticity in adult central nervous system
- Regulation of genes specifying neuronal connections in developing and mature nerv-

ous systems

- Molecular mechanisms that trigger dendritic spine formation

Areas involving behaviors and diseases include the following:

- Roles of glial cells in neurological disease
- Neural control of eating, locomotory, and social behaviors
- Neuroendocrine regulation of innate and social behaviors
- Neural basis of language and reading
- Neural networks controlling locomotion in the spinal cord and brainstem
- Auditory function in Fragile X Syndrome and age-related hearing loss
- Neurolinguistics
- Individual differences in cortical anatomy and relation to behavior
- Learning and memory
- Mechanisms of neuronal death in Alzheimer's disease, stroke, and other disorders

**Admission** Applicants must meet the general admissions requirements of the Riverside Division of the Academic Senate and the UCR Graduate Council as set forth in the Graduate Studies section of this catalog, including completion of an undergraduate degree (B.S. or B.A.). They should have an adequate background in biological and physical sciences, ideally including courses in the following or equivalent areas: General Biology, Genetics, General Chemistry, Organic Chemistry, Physics, Calculus, and Statistics. Additionally, at least 20 quarter-units of courses distributed among the following areas are required, although applicants may be admitted with limited course work deficiencies and required to make up deficiencies as specified by the admissions committee: Biochemistry; Cell Biology; Molecular Biology; Physiology; Animal Behavior; Learning and Memory; Perception; Computer Science; and Neuroscience, Neurobiology, or Physiological Psychology, with laboratory.

## Doctoral Degree

**Course Work** Core requirements include:

1. NRSC 200A/PSYC 200A (Cell/Molecular Neuroscience)  
NRSC 200B/PSYC 200B (Systems Neuroscience)  
NRSC 200C/PSYC 200C (Behavioral Neuroscience)
2. One Research Methods course selected from CBNS 120L/PSYC 120L, CHEM 125, CHEM 221A, CHEM 221B, CHEM 221C, CHEM 221D, NRSC 201, PHYS 139L, PSYC 211
3. Two courses or one course sequence selected from the following: BCH 110A, BCH 110B, BCH 110C, BCH 241/CHEM 241, BIOL 200/CMDB 200, BIOL 201/CMDB 201, BIOL 203, CBNS 120/PSYC 120, CBNS 127/PSYC 127, ENTM 201, PSYC 203A, PSYC 203B, PSYC 203C

The course option most appropriate to the

student's career goals is determined by the student in consultation with his/her guidance committee, which is formed during the first year.

4. During each quarter in academic residence every student enrolls and participates in the Colloquium in Neuroscience (CMDB 257 or NRSC 287/PSYC 287), and, until passing the oral qualifying examination, every student takes at least two seminars, Special Topics in Neuroscience (NRSC 289, 2 units), during each year of academic residence. One seminar per year is required after the qualifying examination is passed.
5. After completing the course requirements and no later than the ninth quarter in residence, the student is given a two-part qualifying examination, one written and one oral.
6. Regardless of whether financial support comes from fellowships or research assistantships, etc., students must be teaching assistants for at least two quarters in Neuroscience or related-area courses, such as those taught by their mentors.
7. Within three months of advancement to candidacy, the student must submit a written dissertation proposal to the dissertation committee for comments and approval. Before the dissertation is given final approval, the student must present a public lecture on the dissertation research to faculty and students in the program. Following the public lecture, the student meets with the dissertation committee for an oral defense in accordance with the regulations of the Graduate Division.

**Normative Time to Degree** 16 quarters

## Graduate Courses

### NRSC 200A. Fundamentals of Neuroscience (3)

Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with PSYC 200A.

### NRSC 200B. Fundamentals of Neuroscience (3)

Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor; NRSC 200A/PSYC 200A. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with PSYC 200B.

### NRSC 200C. Fundamentals of Neuroscience (3)

Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor; NRSC 200B/PSYC 200B. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with PSYC 200C.

### NRSC 201. Neuroscience Laboratory (4) F

Laboratory, 6 hours; lecture, 2 hours. Prerequisite(s): NRSC 200A/PSYC 200A; graduate standing or consent of instructor. Presents theoretical and practical aspects of modern methods and techniques used in nervous system research. Faculty teach modules on methods in which they have special expertise. Methods include, but are not limited to, light and fluorescence microscopy, imaging ion concentrations within cells,

immunocytochemistry, and electrophysiology of model systems.

**NRSC 210. Computational Neurobiology: Introduction to Brain Modeling Techniques (4) S** Lecture, 3 hours; written work, 18 hours per quarter; term paper, 12 hours per quarter. Prerequisite(s): NRSC 200A/PSYC 200A; graduate standing or consent of instructor. An introduction to a variety of computer modeling techniques used to study the brain at the systems level.

**Bazhenov**

### NRSC 287. Colloquium in Neuroscience (1)

Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Involves oral presentations on current research topics in neuroscience by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with PSYC 287.

### NRSC 289. Special Topics in Neuroscience (2)

Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, BIOL 289, CHEM 289, ENTM 289, and PSYC 289.

**NRSC 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Individual study, directed by a faculty member, of specially selected topics in neuroscience. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**NRSC 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Research and experimental studies conducted under the supervision of a faculty member on specially selected topics in neuroscience. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**NRSC 299. Research for the Thesis or Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Peace and Conflict Studies Minor

**Subject abbreviation: PCST**

**College of Humanities, Arts, and Social Sciences**

Juliann Allison, Ph.D. Co-Chair  
Office: Watkins Hall 2219  
(951) 827-4582; juliann.allison@ucr.edu

Erith Jaffe-Berg, Ph.D., Co-Chair  
Office: INTS 2120  
(951) 827-4418; erithj@ucr.edu

Bronwyn Leebaw, Ph.D., Interim Chair  
(Winter 2011)  
Office: Watkins Hall 2213  
(951) 827-7379; bronwyn.leebaw@ucr.edu

### Committee in Charge

Wendy Ashmore, Ph.D. (Anthropology)  
Victoria Bomberry, Ph.D. (Ethnic Studies)

Derek Burrill, Ph.D. (Media and Cultural Studies)  
Christine Gailey, Ph.D. (Women's Studies)  
Bronwyn Leebaw, Ph.D. (Political Science)  
June O'Connor, Ph.D. (Religious Studies)  
Georgia Warnke, Ph.D. (Political Science)  
Stephen E. Cullenberg, Ph.D.

*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

Administered through the Interdisciplinary Studies Office, the Peace and Conflict Studies Minor provides opportunities for undergraduate students to give sustained attention to the diverse origins and expressions of conflict, to models for resolution advised by scholars and practitioners, to proactive peacemaking through the investigative and creative strategies fostered in higher education.

Students must take 5 upper-division courses as specified in sections 1 and 2 below.

1. Students must take at least one course from each of the following three rubrics plus a fourth course from the list below from any rubric:

- a) Perspectives from Religion, Philosophy, Literature and the Arts CLA 141/AST 145/CHN 141/CPAC 141/POSC 140, CPLT 115/GER 163/HISE 163/MCS 115, CPLT 132/FREN 132/GER 132, CPLT 134/GER 134/JPN 134/MCS 114, ENGL 135, RLST 116, RLST 174, RLST 175, RLST 176, THEA 191, VNM 162/AST 162/HIST 187/SEAS 162
- b) Social Scientific Perspectives ETST 111, POSC 123, POSC 124, POSC 124S, POSC 129, POSC 142L, POSC 150, POSC 159, POSC 160, POSC 169, SOC 122
- c) Historical Perspectives HISA 114, HISA 135/ETST 112, HISA 162/LNST 172, HISA 165, HISA 166, HISE 145, HISE 146, HIST 184/AST 160/SEAS 184/VNM 184, MCS 173 (E-Z)/CPLT 173 (E-Z), POSC 125, POSC 162/LNST 142

2. Capstone Course; one of the following:  
PCST 190, PCST 197, PCST 198-I

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Upper-Division Courses

**PCST 190. Special Studies (1-5)** Consultation, 10 hours per quarter; extra reading, 6-9 hours; written work, 3-6 hours. Prerequisite(s): upper-division standing; consent of Peace and Conflict Studies Committee chair; consent of faculty advisor is required for students repeating the course. Individual study in the areas of conflict resolution and mediation. Examines theories in depth, as well as case studies introduced in previous courses. Course is repeatable.

### PCST 197. Research for Undergraduates (4)

Consultation, 10 hours per quarter; extra reading, 6 hours; written work, 3 hours. Prerequisite(s): upper-division standing; consent of Peace and Conflict Studies Committee chair. Directed original research in the fields of conflict resolution, mediation, and peace studies.

**PCST 198-I. Individual Internship in Peace and Conflict Studies (4)** Consultation, 1 hour; internship, 8 hours; written work, 3 hours. Prerequisite(s): upper-division standing; consent of Peace and Conflict Studies Committee chair; consent of faculty advisor is required for students repeating the course. Provides internship opportunities in organizations that engage in mediation and conflict resolution. Includes supervision under an assigned faculty member. Course is repeatable to a maximum of 16 units.

## Pest Management

**Subject Abbreviation: PSMT**  
**College of Natural and Agricultural Sciences**

The M.S. program in Pest Management is not currently accepting new students. For further information call (800) 735-0717 or (951) 827-5621.

## Philosophy

**Subject abbreviation: PHIL**  
**College of Humanities, Arts, and Social Sciences**

John M. Fischer, Ph.D., Chair  
Department Office, 1604 Humanities  
and Social Sciences  
(951) 827-5208; [philosophy.ucr.edu](mailto:philosophy.ucr.edu)

### Professors

Maudemarie Clark, Ph.D.  
Carl F. Cranor, Ph.D.  
John M. Fischer, Ph.D. *President's Chair*  
David K. Glidden, Ph.D.  
Peter J. Graham, Ph.D.  
John Perry, Ph.D.  
Andrews Reath, Ph.D.  
Erich Reck, Ph.D.  
Eric Schwitzgebel, Ph.D.  
Howard K. Wettstein, Ph.D.  
Mark A. Wrathall, Ph.D.  
Larry Wright, Ph.D.

### Professors Emeriti

David Harrah, Ph.D.  
Bernd Magnus, Ph.D.

### Associate Professors

Agnieszka Jaworska, Ph.D.  
Pierre Keller, Ph.D.

### Assistant Professors

Coleen Macnamara, Ph.D.  
Jozef Müller, Ph.D.  
Michael Nelson, Ph.D.

## Majors

The Department of Philosophy offers a major and minor in Philosophy and a major in Philosophy/Law and Society.

The **Philosophy major** is designed to introduce students to the important issues and arguments surrounding such subjects as morality, knowledge, the nature of the mind and of the physical world, science, and language. The program provides a rigorous background in the history of Western philosophy, and studies contemporary approaches (both analytic and Continental) to philosophical issues. The B.A.

degree in Philosophy prepares students for graduate study in philosophy, and is also excellent preparation for law school. For students interested in a double major, philosophy also serves as an excellent complement to psychology, mathematics, political science, and the natural sciences.

The **Philosophy/Law and Society** major offers students a means of understanding complex relationships between social institutions and provides a strong basis for graduate studies in areas related to law and philosophy. The Philosophy/Law and Society curriculum is sound background for students planning on pursuing the study of law.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The department offers two majors: the traditional Philosophy major, and a Philosophy/Law and Society major.

### Philosophy Major

The major requirements for the B.A. degree in Philosophy are as follows:

Fifty-six (56) units of course work in Philosophy including at least 36 upper-division units.

1. PHIL 007 or PHIL 007H and PHIL 008 or PHIL 008H
2. PHIL 100 (Sophomore-Junior Seminar)
3. Three courses in the history of philosophy, at least one of which must be in ancient Greek or Roman philosophy. Select courses from PHIL 030 (E-Z), PHIL 120 (E-Z), PHIL 121 (E-Z), PHIL 122 (E-Z); a specific list is provided by the Philosophy Department. Not more than two courses may be from PHIL 030 (E-Z)
4. At least two courses in metaphysics, epistemology, or philosophy of language: PHIL 130 through PHIL 152, PHIL 159.
5. At least one course in moral and political philosophy: PHIL 108, PHIL 116, PHIL 117, PHIL 119, PHIL 153, PHIL 161 through PHIL 169 (E-Z).

Students are urged to consult the department's undergraduate advisor in preparing their course of study each quarter while at UCR.

### Philosophy/Law and Society Major

Major requirements for a B.A. degree in Philosophy/Law and Society are as follows:

1. **Philosophy requirements** (36 units)
  - a) PHIL 007 or PHIL 007H
  - b) Three courses in the history of philosophy (two of which must be upper-division): PHIL 030 (E-Z), PHIL 120 (E-Z), PHIL 121 (E-Z), PHIL 122 (E-Z)

- c) Five courses in moral and political philosophy: PHIL 108, PHIL 116, PHIL 117, PHIL 119, PHIL 153, and PHIL 161 through PHIL 169 (E-Z)

## 2. Law and Society requirements (36 units)

- a) PHIL 007 or PHIL 007H
- b) LWSO 100
- c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
- d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
- e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
- f) LWSO 193, Senior Seminar

**Note** For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Philosophy Department requirements and Law and Society requirements). The department has its own Philosophy/Law and Society undergraduate advisor, and each student is urged to consult the advisor in preparing a course of study each quarter while at UCR.

## Minor

A student may minor (24 units) in Philosophy by taking either PHIL 007, PHIL 007H, PHIL 008 or PHIL 008H, four upper-division philosophy courses, and one other philosophy course at any level.

Students may also choose to do a Philosophy minor with special emphasis, taking their four upper-division courses from one of the areas listed below:

1. Philosophy, Literature, and History of Philosophy: PHIL 120 (E-Z), PHIL 121 (E-Z), PHIL 122 (E-Z), PHIL 132, PHIL 151, PHIL 152, PHIL 150, PHIL 159
2. Philosophy and Cognitive Science: PHIL 125, PHIL 126, PHIL 130, PHIL 131, PHIL 132, PHIL 133, PHIL 134, PHIL 135
3. Philosophy and the Natural Sciences: PHIL 117, PHIL 130, PHIL 134, PHIL 137, PHIL 140, PHIL 151, PHIL 167
4. Philosophy and Social and Policy Analysis: PHIL 153, PHIL 161, PHIL 162, PHIL 163, PHIL 164, PHIL 165

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Graduate Program

The Department of Philosophy offers the M.A.

and Ph.D. degrees in Philosophy.

**Admission** All applicants to this program must have completed a Bachelor's degree or its approved equivalent from an accredited institution and have attained an undergraduate record that satisfies the standards established by the Graduate Division and University Graduate Council. Applications are accepted for the Fall quarter only. All applicants must submit scores from the Graduate Record Exam, General Test (GRE). Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally each applicant must submit a writing sample and three letters of recommendation, at least two of which must be academic references. All other application requirements are specified in the graduate application.

Upon entering the program, a student is assigned a faculty mentor who consults with the student each quarter to discuss the student's individual course of study, progress in the program, and recent performance. Students also consult the Graduate Adviser regularly to discuss their course of study and progress in the program. In the first year, students (whether they have entered with an M.A. or a B.A.) take three proseminars for first-year graduate students, two in Metaphysics and Epistemology, and one in Moral Philosophy (PHIL 275A, PHIL 275B, PHIL 275C). The proseminars are designed to acquaint first-year students with the current state of discussion in central areas of contemporary philosophy and to impart the skills needed to conduct their own research.

## Master's Degree

The Department of Philosophy offers the M.A. degree in Philosophy under Plan I (Thesis).

**Course Work** Students must complete, with a grade of "B" or better, course work totaling 48 units of graduate credit in philosophy. Of these, 12 units must be in the three proseminars for first-year graduate students, and an additional 20 units must be seminars and workshops in the 272-283 series. Up to 16 units may be drawn from PHIL 125, courses in the PHIL 220-266 series, or PHIL 290-292, depending on the student's interests and background. These courses are to be chosen only in consultation with the student's advisory committee and the graduate advisor.

Courses taken on a Satisfactory (S)/No Credit (NC) basis cannot be used to satisfy course requirements.

Students should note that although they need not complete distributional requirements or a language requirement to acquire the M.A. degree, there are strict distributional and language requirements for the Ph.D. degree, as

well as a colloquium and professional development workshop requirement (described below under the Ph.D. requirements). Students who expect to continue on in the Ph.D. program must begin to fulfill these requirements immediately upon entering the program if they expect to acquire the Ph.D. degree within the prescribed period of time.

**M.A. Logic Requirement** The logic requirement for the M.A. degree is completion of PHIL 124 with a grade of "B" or better. Students may be excused from this requirement if they show sufficient knowledge of logic upon entering the graduate program, as indicated by an optional diagnostic examination administered at the start of each academic year. Students who are unsure about the adequacy of their background are encouraged to take the test for diagnostic purposes.

**M.A. Paper** Students select a paper to submit to the graduate advisor as their M.A. paper no later than the end of the spring quarter of their second year. M.A. papers can be seminar papers, revised seminar papers, or any other paper that the student has written (of 25 pages or less). Further information on what constitutes an acceptable paper is available from the graduate advisor.

Upon the submission of this paper, the graduate advisor selects three faculty members to serve as the M.A. committee, which conducts an oral examination on the paper. Normally the oral examination will be completed before the end of the student's second year, but it may be postponed until the fall quarter of the student's third year. Failure to pass the M.A. oral examination after two opportunities constitutes grounds for dismissal from the program. In addition, completion of the M.A. requirements does not guarantee permission to continue in the Ph.D. program.

## Doctoral Degree

The Department of Philosophy offers the Ph.D. degree in Philosophy.

**Admission** Students are invited to continue toward candidacy for the Ph.D. degree on the basis of performance in courses and seminars, satisfactory completion of the M.A. requirements, and the recommendation of the graduate advisor. A student's course of study is supervised by the student's faculty mentor, in consultation with the graduate advisor until the student's dissertation committee is appointed. Students with a master's degree in Philosophy from other universities are eligible for admission. These students must enroll in the first-year proseminars.

**Course Work** Students must complete 12 more units in philosophy, with a grade of "B" or better, in addition to the 48 units for the M.A. degree. Of the student's 60 graduate units in philosophy, 12 units must be in the area of the history of philosophy, with 4 of these in ancient philosophy, 4 units in addition to the proseminar (PHIL 275A, PHIL 275B) in the area of

metaphysics and epistemology, and 8 units in addition to the proseminar (PHIL 275C) in the area of ethics, political philosophy, and aesthetics.

Forty of these 60 units must be seminars and workshops in the 272-283 series. Up to 20 units may be drawn from PHIL 125, courses in the PHIL 220-266 series, or PHIL 290-292. Courses taken on a Satisfactory (S)/No Credit (NC) basis cannot be used to satisfy course requirements. Students are in addition expected to take one seminar on an S/NC basis each quarter until they advance to candidacy.

### Colloquia and Professional Development

**Workshop Requirement** Students must register for the PHIL 270 (Philosophy Colloquia) during each quarter of their first and second years. Students must register for PHIL 400 (Research and Professional Development Workshop) during each quarter of their second and third years.

**Language Requirement** Students must show the competence necessary to work in one of four foreign languages: French, German, Latin, or Greek. Another language may be substituted upon approval of the faculty if it agrees better with the student's area of their research.

**Logic Requirement** To satisfy the logic requirement, students must pass PHIL 125 (Intermediate Logic) with a grade of "B" or better.

**Proposition Requirement** All Ph.D. students must complete an acceptable proposition normally during their third year in the program. A proposition is a paper, no more than forty pages in length, devoted to a significant problem in philosophy. It should show the ability to mount a sustained thesis and to work with the relevant primary or secondary literature.

### Written and Oral Qualifying Examinations

Students must write a dissertation prospectus and pass a qualifying oral examination before advancing to candidacy. This examination, which is supervised by a faculty committee as stipulated in the regulations of the Graduate Division, concentrates on the students' preparation for writing a dissertation as indicated by the dissertation prospectus. It must be taken after the student has passed the M.A. language and proposition requirements and normally occurs within two quarters of the completion of these requirements.

**Dissertation and Final Oral Examination** A dissertation to be presented as prescribed by the Graduate Council is prepared under the direction of the candidate's dissertation committee. After completion of the dissertation, the candidate is examined in its defense by the dissertation committee.

**Normative Time to Degree** 18 quarters

## Lower-Division Courses

**PHIL 001. Introduction to Philosophy (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introductory exploration into the nature of the individ-

ual, his/her place in the universe, and the forces that shape his/her destiny. Credit is awarded for only one of PHIL 001 or PHIL 001H.

**PHIL 001H. Honors Introduction to Philosophy (4)**

Lecture, 2 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to PHIL 001. An introductory course designed to explore a small number of classical texts central to philosophy and the liberal arts and sciences. Students examine issues surrounding the nature of knowledge, the foundations of moral philosophy, and the relation of both to the development of the human and natural sciences. Texts may vary from year to year and include works by such authors as Plato, Aristotle, Descartes, Hobbes, Hume, and Kant. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 001 or PHIL 001H.

**PHIL 002. Contemporary Moral Issues (4)** Lecture, 2 hours; discussion, 1 hour; consultation, 1 hour. Prerequisite(s): none. Philosophical analysis of contemporary moral issues such as: abortion, discrimination, sexual morality, punishment, the obligation to obey the law, suicide, euthanasia, war, privacy. Credit is awarded for one only of PHIL 002 or PHIL 002H.

**PHIL 002H. Honors Contemporary Moral Issues (4)**

Lecture, 2 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to PHIL 002. Philosophical analysis of contemporary moral issues such as abortion, discrimination, sexual morality, punishment, the obligation to obey the law, suicide, euthanasia, war, and privacy. Satisfactory (S) or No Credit (NC) grading is not available. Credit is only awarded for one of PHIL 002 or PHIL 002H.

**PHIL 003. Ethics and the Meaning of Life (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Approaches one of the basic questions of value: How should one live? Covers classical and contemporary discussions of issues such as the human good, human virtue, the role of pleasure and happiness, egoism and altruism, duty, the relativity and objectivity of value, the meaning of life, death, autonomy, integrity, and conscience. Credit is awarded for only one of PHIL 003 or PHIL 003H.

**PHIL 003H. Honors Ethics and the Meaning of Life (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to PHIL 003. Approaches one of the basic questions of value: How should one live? Covers classical and contemporary discussions of issues such as the human good, human virtue, the role of pleasure and happiness, egoism and altruism, duty, the relativity and objectivity of value, the meaning of life, death, autonomy, integrity, and conscience. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 003 or PHIL 003H.

**PHIL 004. Introduction to the Philosophy of Race (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the philosophy of race from classical theorists to contemporary critical race theory. Topics covered include the Enlightenment, discussions of race in the founding of the American Republic, Supreme Court decisions from Dred Scott to recent affirmative action decisions, and the concept of race as a social construction.

**PHIL 005. Evil (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the nature of evil, its motivation, and its origins. Utilizes a variety of sources to examine these themes, including

classical philosophical texts and contemporary films. Credit is awarded for only one of PHIL 005 or PHIL 005H.

**PHIL 005H. Honors Evil (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to PHIL 005. An introduction to the nature of evil, its motivation, and its origins. Utilizes a variety of sources to examine these themes, including classical philosophical texts and contemporary films. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 005 or PHIL 005H.

**PHIL 006. Reason, Belief, and Truth (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introductory examination of the nature of reason, rationality, argument, proof, and persuasion and the nature of theory, belief, faith and conviction, and truth and falsity. Discusses the various bodies of belief and modes of inquiry, such as the natural and social sciences, the humanities, morality, religion, and mathematics.

**PHIL 007. Introduction to Critical Thinking (4)** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): none. A practical examination of reasoning and argument typically illustrated. Credit is awarded for only one of PHIL 007 or PHIL 007H.

**PHIL 007H. Honors Introduction to Critical Thinking (4)**

Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to PHIL 007. A practical examination of reasoning and argument, typically illustrated. Satisfactory (S) or No Credit (NC) grading is not available. Credit is only awarded for one of PHIL 007 or PHIL 007H.

**PHIL 008. Introduction to Logic (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to symbolic logic. Teaches how to distinguish, in a precise way, valid deductive arguments from those that are invalid; includes learning to use logical symbolism, truth tables, and formal deductions. Credit is awarded for only one of PHIL 008 or PHIL 008H.

**PHIL 008H. Honors Introduction to Logic (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to PHIL 008. An introduction to symbolic logic. Teaches how to distinguish, in a precise way, valid deductive arguments from those that are invalid; includes learning symbolism, truth tables, and formal deductions. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 008 or PHIL 008H.

**PHIL 009. Biomedical Ethics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces the major camps in ethical theory - utilitarianism, deontology, virtue ethics, and feminist ethics. Applies these theories to critically examine contemporary issues in bioethics. Includes stem-cell research, assisted reproductive technologies, contract gestation, maternal-fetal conflicts, genetic and pharmacological enhancements, access to health care, and physician-assisted suicide. Credit is awarded for only one of PHIL 009 or PHIL 009H.

**PHIL 009H. Honors Biomedical Ethics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to PHIL 009. Introduces the major camps in ethical theory - utilitarianism, deontology, virtue ethics, and feminist ethics. Applies these theories to critically examine contempo-

rary issues in bioethics. Includes stem-cell research, assisted reproductive technologies, contract gestation, maternal-fetal conflicts, genetic and pharmacological enhancements, access to health care, and physician-assisted suicide. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 009 or PHIL 009H.

**PHIL 010. Language, Mind, and Reality (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Explores the nature of language, communication, and mentality and their role in shaping our thought and experience of the world. Tackles questions about the innateness of concepts, the social and rational norms governing communication, the nature of speech acts and their connection to hate speech and pornography, and the scope of mentality. Credit is awarded for only one of PHIL 010 or PHIL 010H.

**PHIL 010H. Honors Language, Mind, and Reality (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to PHIL 010. Explores the nature of language, communication, and mentality and their role in shaping our thought and experience of the world. Tackles questions about the innateness of concepts, the social and rational norms governing communication, the nature of speech acts and their connection to hate speech and pornography, and the scope of mentality. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 010 or PHIL 010H.

**PHIL 012. Introductory Seminar in Moral**

**Philosophy (4)** Seminar, 3 hours; extra reading, 2 hours. Prerequisite(s): none. An introduction to a small number of central moral issues: Small class size in order to provide for substantial discussion and close supervision of written papers.

**PHIL 030 (E-Z). Introduction to the History of**

**Philosophy (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introductory surveys of important periods and subjects in the history of Western philosophy. Topics include E. Hellenic Philosophy: Pre-Socratics through Aristotle; F. Hellenistic Philosophy: Epicureans, Stoics, and Skeptics; G. Medieval Philosophy; I. Early Modern Philosophy; J. Late Modern Philosophy; K. Nineteenth-Century Philosophy; M. History of Ethics; N. History of Political Philosophy.

## Upper-Division Courses

**PHIL 100. Sophomore-Junior Seminar (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): one course in philosophy; sophomore, junior, or senior standing in Philosophy or Philosophy/Law and Society. A writing-intensive seminar designed to introduce students to philosophical analysis and writing through an in-depth focus on a philosophical text or issue. Content varies.

**PHIL 107. Languages and Minds (4)**

Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): one course in philosophy or consent of instructor. An investigation of interrelated issues in the philosophy of mind and language, including the mind-body relation, theories of meaning, how thoughts and language represent states of affairs in the world, and the nature of consciousness.

**PHIL 108. Philosophical Issues of Race and Gender (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates philosophical issues concerning race and gender. Themes include the role of cultural and biological criteria in defining these concepts; the roles of race and gender in personal identity; the nature of racism, sexism, and their variants; and policy

implications such as affirmative action and the civil status of homosexual relationships. Cross-listed with WMST 108.

**PHIL 110. Asian Philosophy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A general introduction to philosophy as well as a survey of Asian contributions to philosophy, focusing on the Indian and Chinese traditions. Examines questions concerning how best to live one's life, what can be known, the relation between mind and body, whether there are minds and bodies, and the nature of the universe.

**PHIL 111. Philosophy, Film, and Reflective Popular Culture (4)** Lecture, 3 hours; screening, 1 hour; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines a number of philosophical themes as depicted in film and/or other media of reflective popular culture. Four or five films are screened; each is examined for the philosophical issues it raises. Themes may include integrity, love, spirituality, meaning, identity, and morality.

**PHIL 112. Mortal Questions (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on aspects of our distinctively human capacity to lead a meaningful life, especially investigating aspects of the nature of the mind and human freedom. The nature of death and its place in the context of a meaningful life is discussed.

**PHIL 113. God (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. Topics include examination of the nature of divinity and the nature of evil, the influence of the concept of God upon philosophical history, ideals, and values, and the riddle of an after-life.

**PHIL 114. Science and Human Understanding (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Discusses how contemporary philosophers have examined human understanding as exemplified in science.

**PHIL 115. The Care of the Soul (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A historical and contemporary examination of the role philosophy has played in nurturing the human spirit in the face of other philosophical efforts to demythologize the soul into neural functions or even mere congeries of atoms in motion in the void.

**PHIL 116. Business Ethics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An inquiry into some of the moral issues arising from business life, such as conflicts of interest, responsibility to consumers, corporate culture and character, and the morality of competition. Also considers the history of ethics and the history business as an institution.

**PHIL 117. Environmental Ethics (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. A philosophical consideration of ethical problems that arise from the use and exploitation of the environment. Topics covered include workplace pollution hazards; environmental pollution and protection of collective natural resources; the rights of future generations; the rights of animals; the protection of endangered species.

**PHIL 118. Personhood and Personal Identity (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Develops the basic elements of the concept of personhood, and how persons are alleged to be crucially different from non-human animals. Various theories are considered about what is essential to us

as individuals and what makes us the same person over time. Explores the relationship between these metaphysical issues and moral issues, such as euthanasia, animals' rights, and abortion.

**PHIL 119. Economics and Philosophy (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B or consent of instructor. Examines issues on the boundary of economics and philosophy. Topics include social choice theory and economic justice; foundations of utility theory, rational choice, and economic welfare; and epistemology and the philosophies of science of Popper, Kuhn, and others. Cross-listed with ECON 117.

**PHIL 120 (E-Z). Ancient Philosophy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Each segment covers a major figure in ancient Greek or Roman philosophy. E. Plato; F. Aristotle; G. Plato and Aristotle; I. Cicero; J. Seneca; K. Plutarch. Credit is awarded for only one of PHIL 120 (E-Z) or PHIL 220 (E-Z).

**PHIL 121 (E-Z). Major Philosophers (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Each segment covers a major figure in the history of medieval, early modern, or late modern philosophy. E. Aquinas; F. Descartes; G. Leibniz; I. Spinoza; J. Locke; K. Hume; M. Reid; N. Kant; O. Hegel; Q. Nietzsche; R. Royce; S. Freud; T. Heidegger; V. Wittgenstein; X. Kripke. Credit is awarded for only one of each of the corresponding lettered segments of PHIL 121 (E-Z) and PHIL 221 (E-Z).

**PHIL 122 (E-Z). Topics in History of Philosophy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Topics include E. Ancient Philosophy; F. Medieval Philosophy; I. French Renaissance Philosophy; J. Early Modern Philosophy; M. Moral Theories of Hume and Kant; N. Nineteenth-Century Philosophy; O. Kant and Post-Kantian European Moral Philosophy; Q. Political Philosophy; R. Origins of Analytical Philosophy. Credit is awarded for only one of each of the corresponding lettered segments of PHIL 122 (E-Z) and PHIL 222 (E-Z).

**PHIL 123. Readings in Classical Chinese Philosophy (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CHN 104 or consent of instructor. Introduces selections from key philosophical texts in classical Chinese. Focuses on a combination of Chinese reading and philosophical understanding. Cross-listed with CHN 106.

**PHIL 124. Formal Logic (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 011/MATH 011 or CS 120A/EE 120A or CS 150 or PHIL 008 or PHIL 008H or consent of instructor. An introduction to first-order logic, the core of the logic often used in contemporary philosophy, mathematics, computer science, and linguistics.

**PHIL 125. Intermediate Logic (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): PHIL 124 or consent of instructor. The basic metatheory of first-order logic; with an emphasis on the precise relation between its syntax (formulas, rules of inference, and proofs) and semantics (interpretations, truth, validity), leading to the soundness and completeness theorems.

**PHIL 126. Advanced Logic (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): PHIL 125. Advanced metatheory of first-order logic, leading to a discussion of some of the important incompleteness, undecidability and non-expressability results of twentieth-century logic (Godel, Church, Turing, etc.).

**PHIL 127. Advanced Topics in Logic (4)** Lecture, 3 hours; extra reading, 1 hour; problem sets, 3 hours. Prerequisite(s): PHIL 124 or PHIL 125. A study of selected non-truth-functional and nonstandard logics. Includes modal logics, tense logics, free logics, paraconsistent logics, and set theory. Course is repeatable as content changes.

**PHIL 128. Introduction to Arabic Philosophy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic philosophical texts. Provides close and literary reading of texts in philosophy, as well as considers the impact these texts have had or can have on Western cultural formation. Cross-listed with ARLC 154 and CPLT 154.

**PHIL 130. Theory of Knowledge (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. An inquiry into the nature of human knowledge—its possibility, criteria, scope, and limitations. Credit is awarded for only one of PHIL 130 or PHIL 230.

**PHIL 131. Twentieth-Century Analytic Philosophy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. A discussion of some major issues and thinkers in the tradition dominant in twentieth-century British and American philosophy. Philosophers discussed might include Frege, Russell, Carnap, Quine, Kripke, and D. Lewis. Credit is awarded for only one of PHIL 131 or PHIL 231.

**PHIL 132. Philosophy of Language (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of some of the traditional issues in the philosophy of language, such as analyticity, theories of reference, truth, speech act theory, and philosophical theories of formal grammars. Credit is awarded for only one of PHIL 132 or PHIL 232.

**PHIL 133. Metaphysics (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. An investigation of some of the traditional problems in Western philosophy that have been labeled metaphysical, such as the existence of God, the relationship between mind and body, the determinism versus free will debate, and the nature of time and space. Credit is awarded for only one of PHIL 133 or PHIL 233.

**PHIL 134. Philosophy of Mind (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. A study of several theories of the nature of mind and an analysis of particular issues occasioned by them: the mind-body problem, personal identity, emotions, human action, self-knowledge, knowledge of other minds, and explanations of human behavior. Credit is awarded for only one of PHIL 134 or PHIL 234.

**PHIL 135. Philosophy of Psychology (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Examines philosophical issues arising in the context of empirical psychology. Topics may include moral development, artificial intelligence and the modeling of cognition, the nature of perception and memory, fallacies in human reasoning, mechanisms of self-understanding, and mental illness and personhood. Credit is awarded for only one of PHIL 135 or PHIL 235.

**PHIL 137. Philosophy of Science (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Topics discussed include understanding scientific objectivity in the light of history and sociology of science; realism and anti-realism about scientific theories; scientific methodology and its logic; and the nature of scientific explanation.

tion. Credit is awarded for only one of PHIL 137 or PHIL 237.

**PHIL 138. Philosophy of Agency (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. An investigation of problems that arise in attempts to understand human agency: the nature and explanation of action, intention, free will and moral responsibility, and weakness of will. Credit is awarded for only one of PHIL 138 or PHIL 238.

**PHIL 139. Philosophy of Mathematics (4)** Lecture, 3 hours; extra reading, written work, homework problems, 3 hours. Prerequisite(s): PHIL 124 or one mathematics course or consent of instructor. Discusses topics such as the abstract nature of mathematical objects, the sources of mathematical knowledge, the relation between mathematics and logic, and the infinite in mathematics. Considers the development of some selected parts of mathematics (especially arithmetic, geometry, algebra, and set theory) and of various corresponding philosophical positions (platonism, formalism, intuitionism, structuralism). Course is repeatable as content changes. Credit is awarded for only one of PHIL 139 or PHIL 239.

**PHIL 140. Topics in Metaphysics (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. An in-depth discussion of selected issues in contemporary metaphysics, such as abstract objects, essentialism and identity, laws of nature, free will, and determinism. Course is repeatable as content changes.

**PHIL 142. Advanced Topics in the Philosophy of Language (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): PHIL 107 or PHIL 132 or consent of instructor. An in-depth study of a particular topic in the philosophy of language. Potential topics include context-sensitivity (how the meaning of a sentence depends upon nonlinguistic facts about context); theories of meaning (e.g., the Frege-Russell account in terms of propositions, the Lewis-Stalnaker possible worlds account, and Davidson's truth theory account). Course is repeatable as content changes to a maximum of 8 units. Credit is awarded for only one of PHIL 142 or PHIL 242.

**PHIL 144. Advanced Topics in Philosophy of Mind (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): PHIL 107 or PHIL 134 or consent of instructor. Examines a selected topic in philosophy of mind. Potential topics include consciousness and self-consciousness; intentionality and theories of mental content; mental causation; consciousness and free will; introspection and knowledge of other minds; perception; emotion; imagination; concepts and rationality; artificial minds; and animal minds. Course is repeatable as content changes to a maximum of 8 units. Credit is awarded for only one of PHIL 144 or PHIL 244.

**PHIL 150. Philosophy in Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. An examination of philosophical issues raised by selected novelists, poets, and playwrights.

**PHIL 151. Existentialism (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of philosophical and literary works which deal with the significance of some fundamental human experiences: identity crises, choice and commitment, anxiety and death, the experience of meaninglessness,

and alienation. Credit is awarded for only one of PHIL 151 or PHIL 251.

**PHIL 152. Twentieth-Century Continental Philosophy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Examines the character and consequences of several recent movements in continental philosophy, including hermeneutics, structuralism, deconstruction, and critical theory. Authors discussed include Heidegger, Gadamer, Habermas, Derrida, and Foucault. Credit is awarded for only one of PHIL 152 or PHIL 252.

**PHIL 153. Marxist Critique (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the ideas central to the tradition of Western Marxism: ideology, critique, reification, instrumental reason, the domination of nature, and communicative action. Theorists discussed typically include Hegel, Marx, Lukacs, Adorno, Horkheimer, Benjamin, and Habermas. Credit is awarded for only one of PHIL 153 or PHIL 253.

**PHIL 155. Peace in the Middle East (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the roots of the Middle Eastern crises. Focuses on the Arab-Israeli conflict and possible solutions toward peace. Addresses problems through historical, religious, and political lines of inquiry. Cross-listed with RLST 155.

**PHIL 159. Philosophy of Religion (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A historical, critical examination of the concepts and arguments involved in the Judeo-Christian God-hypothesis, and the influence of this world view upon the ideals and values of the Western world. Credit is awarded for only one of PHIL 159 or PHIL 259.

**PHIL 161. Ethics (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. A study of the major classical moral philosophers in the Western tradition and of some selected problems of metaethics. Credit is awarded for only one of PHIL 161 or PHIL 261.

**PHIL 162. Human Nature and Radical Evil (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. An advanced study of theories of human nature and evil. Credit is awarded for only one of PHIL 162 or PHIL 262.

**PHIL 163. Political Philosophy (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An inquiry into some of the main philosophic issues arising from political life, such as the nature and justification of authority, democracy, natural rights, justice, equality, and civil disobedience. Credit is awarded for only one of PHIL 163 or PHIL 263.

**PHIL 164. Justice (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A philosophical analysis of the concept of justice. Credit is awarded for only one of PHIL 164 or PHIL 264.

**PHIL 165. Philosophy of Law (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An inquiry into the nature of criminal law, the relation between law and morality, the nature of legal responsibility, and the obligation to obey the law. Credit is awarded for only one of PHIL 165 or PHIL 265.

**PHIL 166. Philosophy of Feminism (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of current concepts and debates in feminist philosophy including gender equality, gender difference, and the relation of sex and gender. Situates various approaches to these topics in the history of philosophy. Credit is awarded for only one of PHIL 166 or PHIL 266.

**PHIL 167. Biomedical Ethics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A philosophical discussion of newly emerging issues, both ethical and social, in biology and medicine, such as genetic engineering, euthanasia, experimentation with human subjects, abortion, behavior control, and patient's right to know.

**PHIL 168. Ethics and Families (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of some of the ethical issues that arise in and with regard to families of different kinds. Issues may include gender relations in "traditional marriages"; the ethics of same-sex marriage; the morality of abortion, surrogate mothering, and cloning; the justice of school vouchers; the grounds for universal health care; and possible gender inequalities in divorce. Cross-listed with WMST 141.

**PHIL 169 (E-Z). Topics in Value Theory (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Topics include E. Ethics; F. Aesthetics; G. Political Philosophy; I. Social Philosophy; J. Philosophy of Law.

**PHIL 171. Feminist Bioethics (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An exploration of the ways in which feminist theory provides insight on contemporary issues in bioethics. Topics include women in clinical research, cosmetic surgery, abortion, contract gestation, fetal protection policies, and the politics of mental illness. Cross-listed with WMST 106.

**PHIL 173. Philosophy of Sex and Sexuality (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Investigates philosophical issues relating to human sexual behaviors and identities. Topics include attempts to distinguish sexual from nonsexual activities; the construction and medicalization of sex and sexuality; and historical and contemporary ethical evaluations of various sexual activities and identities (homosexuality, heterosexuality, masturbation, sado-masochism, various fetichisms, polyamory, and other nonmonogamies).

**PHIL 190. Special Studies (1-5)** To be taken with the consent of the department Chair as a means of meeting special curricular problems. Course is repeatable to a maximum of 16 units.

**PHIL 193. Senior Seminar (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): two upper-division courses in philosophy; senior standing in Philosophy or Philosophy/Law and Society or consent of instructor. Advanced seminar for Philosophy majors. Course is repeatable as content changes to a maximum of 8 units.

**PHIL 195. Senior Thesis (1-4)** Prerequisite(s): enrollment by request of student with approval of department chair. Course is graded In Progress (IP) until the thesis is completed. Course is repeatable to a maximum of 8 units.

**PHIL 198-I. Individual Internship in Philosophy (2-8)** Internship, 4-16 hours; written work, 2-8 hours.

Prerequisite(s): upper-division standing; consent of instructor. An intern assignment in government, education, science, business, or other field related to philosophy. Students write a substantive philosophical paper pertaining to the work done in the internship. Course is repeatable to a maximum of 8 units.

## Graduate Courses

**PHIL 220 (E-Z). Ancient Philosophy (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Each segment covers a major figure in ancient Greek or Roman philosophy. E. Plato; F. Aristotle; G. Plato and Aristotle; I. Cicero; J. Seneca; K. Plutarch. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of each of the corresponding lettered segments of PHIL 120 (E-Z) and PHIL 220 (E-Z).

**PHIL 221 (E-Z). Major Philosophers (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Each segment covers a major figure in the history of medieval, early modern, or late modern philosophy. E. Aquinas; F. Descartes; G. Leibniz; I. Spinoza; J. Locke; K. Hume; M. Reid; N. Kant; O. Hegel; Q. Nietzsche; R. Royce; S. Freud; T. Heidegger; V. Wittgenstein; X. Kripke. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of each of the corresponding lettered segments of PHIL 121 (E-Z) and PHIL 221 (E-Z).

**PHIL 222 (E-Z). Topics in History of Philosophy (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Topics include E. Ancient Philosophy; F. Medieval Philosophy; I. French Renaissance Philosophy; J. Early Modern Philosophy; M. Moral Theories of Hume and Kant; N. Nineteenth-Century Philosophy; O. Kant and Post-Kantian European Moral Philosophy; Q. Political Philosophy; R. Origins of Analytical Philosophy. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of each of the corresponding lettered segments of PHIL 122 (E-Z) and PHIL 222 (E-Z).

**PHIL 230. Theory of Knowledge (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An inquiry into the nature of human knowledge—its possibility, criteria, scope, and limitations. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 130 or PHIL 230.

**PHIL 231. Twentieth-Century Analytic Philosophy (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. A discussion of some major issues and thinkers in the tradition dominant in twentieth-century British and American philosophy. Philosophers discussed might include Frege, Russell, Carnap, Quine, Kripke, and D. Lewis. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 131 or PHIL 231.

**PHIL 232. Philosophy of Language (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. A study of some of the traditional issues in the philosophy of language, such as analyticity, theo-

ries of reference, truth, speech act theory, and philosophical theories of formal grammars. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 132 or PHIL 232.

**PHIL 233. Metaphysics (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An investigation of some of the traditional problems in Western philosophy that have been labeled metaphysical, such as the existence of God, the relationship between mind and body, the determinism versus free will debate, and the nature of time and space. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 133 or PHIL 233.

**PHIL 234. Philosophy of Mind (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. A study of several theories of the nature of mind and an analysis of particular issues occasioned by them: the mind-body problem, personal identity, emotions, human action, self-knowledge, knowledge of other minds, and explanations of human behavior. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 134 or PHIL 234.

**PHIL 235. Philosophy of Psychology (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Examines philosophical issues arising in the context of empirical psychology. Topics may include moral development, artificial intelligence and the modeling of cognition, the nature of perception and memory, fallacies in human reasoning, mechanisms of self-understanding, and mental illness and personhood. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 135 or PHIL 235.

**PHIL 237. Philosophy of Science (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Topics discussed include understanding scientific objectivity in the light of the history and sociology of science; realism and antirealism about scientific theories; scientific methodology and its logic; and the nature of scientific explanation. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 137 or PHIL 237.

**PHIL 238. Philosophy of Agency (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An investigation of problems that arise in attempts to understand human agency, such as the nature and explanation of action, intention, free will and moral responsibility, and weakness of will. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 138 or PHIL 238.

**PHIL 239. Philosophy of Mathematics (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Discusses topics such as the abstract nature of mathematical objects, the sources of mathematical knowledge, the relation between mathematics and logic, and the infinite in mathematics. Considers the development of some selected parts of mathematics (especially arithmetic, geometry, algebra, and set theory) and of various corresponding philosophical posi-

tions (platonism, formalism, intuitionism, structuralism). Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes. Credit is awarded for only one of PHIL 139 or PHIL 239.

**PHIL 242. Advanced Topics in the Philosophy of Language (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An in-depth study of a particular topic in the philosophy of language. Potential topics include context-sensitivity (how the meaning of a sentence depends upon nonlinguistic facts about context); theories of meaning (e.g., the Frege-Russell account in terms of propositions, the Lewis-Stalnaker possible worlds account, and Davidson's truth theory account). Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes to a maximum of 8 units. Credit is awarded for only one of PHIL 142 or PHIL 242.

**PHIL 244. Advanced Topics in Philosophy of Mind (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Examines a selected topic in philosophy of mind. Potential topics include consciousness and self-consciousness; intentionality and theories of mental content; mental causation; consciousness and free will; introspection and knowledge of other minds; perception; emotion; imagination; concepts and rationality; artificial minds; and animal minds. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes to a maximum of 8 units. Credit is awarded for only one of PHIL 144 or PHIL 244.

**PHIL 251. Existentialism (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An examination of philosophical and literary works which deal with the significance of some fundamental human experiences: identity crises, choice and commitment, anxiety and death, the experience of meaninglessness, and alienation. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 151 or PHIL 251.

**PHIL 252. Twentieth-Century Continental Philosophy (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Examines the character and consequences of several recent movements in continental philosophy, including hermeneutics, structuralism, deconstruction, and critical theory. Authors discussed include Heidegger, Gadamer, Habermas, Derrida, and Foucault. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 152 or PHIL 252.

**PHIL 253. Marxist Critique (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An examination of the ideas central to the tradition of Western Marxism: ideology, critique, reification, instrumental reason, the domination of nature, and communicative action. Theorists discussed typically include Hegel, Marx, Lukacs, Adorno, Horkheimer, Benjamin, and Habermas. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 153 or PHIL 253.

**PHIL 259. Philosophy of Religion (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. A historical, critical examination of the concepts and arguments involved in the Judeo-Christian God-hypothesis, and the influence of this world view on the ideals and values of the Western world. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 159 or PHIL 259.

**PHIL 261. Ethics (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. A study of the major classical moral philosophers in the Western tradition and of some selected problems of metaethics. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 161 or PHIL 261.

**PHIL 262. Human Nature and Radical Evil (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An advanced study of theories of human nature and evil. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 162 or PHIL 262.

**PHIL 263. Political Philosophy (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An inquiry into some of the main philosophic issues arising from political life, such as the nature and justification of authority, democracy, natural rights, justice, equality, and civil disobedience. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 163 or PHIL 263.

**PHIL 264. Justice (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. A philosophical analysis of the concept of justice. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 164 or PHIL 264.

**PHIL 265. Philosophy of Law (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An inquiry into the nature of criminal law, the relation between law and morality, the nature of legal responsibility, and the obligation to obey the law. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 165 or PHIL 265.

**PHIL 266. Philosophy of Feminism (4)** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An analysis of current concepts and debates in feminist philosophy including gender equality, gender difference, and the relation of sex and gender. Situates various approaches to these topics in the history of philosophy. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 166 or PHIL 266.

**PHIL 270. Philosophy Colloquia (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing. Visiting scholars give oral reports on current research in philosophy and discuss them with students and faculty. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PHIL 272A. Workshop in Philosophy (2-4)** Workshop, 2-3 hours; outside research, 1-3 hours. Prerequisite(s): graduate standing; consent of instructor. Close reading of a philosophical text or texts on a single topic. May be undertaken as a one-, two-, or three-quarter course (PHIL 272A, PHIL 272B, PHIL 272C). Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned. PHIL 272A, PHIL 272B, and PHIL 272C are repeatable as their contents change to a maximum of 12 units on one topic and to a maximum of 36 units for the three courses.

**PHIL 272B. Workshop in Philosophy (2-4)** Workshop, 2-3 hours; outside research, 1-3 hours. Prerequisite(s): PHIL 272A; consent of instructor. Close reading of a philosophical text or texts on a single topic. May be undertaken as a one-, two-, or three-quarter course (PHIL 272A, PHIL 272B, PHIL 272C). Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned. PHIL 272A, PHIL 272B, and PHIL 272C are repeatable as their contents change to a maximum of 12 units on one topic and to a maximum of 36 units for the three courses.

**PHIL 272C. Workshop in Philosophy (2-4)** Workshop, 2-3 hours; outside research, 1-3 hours. Prerequisite(s): PHIL 272B; consent of instructor. Close reading of a philosophical text or texts on a single topic. May be undertaken as a one-, two-, or three-quarter course (PHIL 272A, PHIL 272B, PHIL 272C). Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned. PHIL 272A, PHIL 272B, and PHIL 272C are repeatable as their contents change to a maximum of 12 units on one topic and to a maximum of 36 units for the three courses.

**PHIL 275A. Proseminar for First-Year Graduate Students: Metaphysics and Epistemology (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): first-year standing in the graduate program in Philosophy. One course in a three-term sequence designed to introduce new graduate students to current issues and methods of research in metaphysics and epistemology.

**PHIL 275B. Proseminar for First-Year Graduate Students: Metaphysics and Epistemology (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 275A; first-year standing in the graduate program in Philosophy. One course in a three-term sequence designed to introduce new graduate students to current issues and methods of research in additional areas of metaphysics and epistemology.

**PHIL 275C. Proseminar for First-Year Graduate Students: Moral Philosophy (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): first-year standing in the graduate program in Philosophy. One course in a three-term sequence designed to introduce new graduate students to current issues and methods of research.

**PHIL 280. Seminar in Philosophical Problems (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers an important philosophical problem. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**PHIL 281. Philosophical Texts (1-4)** Seminar, 1-3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Involves focused reading and discussion of common text on research topics in philosophy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**PHIL 282. Seminar in Individual Philosophers (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers a major figure in the history of philosophy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**PHIL 283. Seminar in Contemporary Philosophy (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers an aspect of contemporary philosophy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

**PHIL 290. Directed Studies (1-6)** Term paper, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor. Directed study to meet special curricular needs. Course is repeatable.

**PHIL 291. Individual Studies in Coordinated Areas (2-4)** Prerequisite(s): graduate standing. A program of studies designed to advise and assist candidates who are preparing for the Comprehensive Examinations. Open to M.A. students only; does not count toward the unit requirement for the M.A. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PHIL 292. Concurrent Analytical Studies in Philosophy (1-4)** Prerequisite(s): consent of instructor. Each 292 course will be taken concurrently with some 100-series course, approved by the Graduate Advisor, but on an individual basis. It will be devoted to completion of a graduate paper based on research or criticism related to the 100-series course. Faculty guides and evaluations will be provided throughout the quarter. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**PHIL 297. Directed Research (1-6)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PHIL 299. Research for Thesis or Dissertation (1-12)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**PHIL 301. Directed Studies in the Teaching of Philosophy (1)** Seminar, 1 hour. Prerequisite(s): graduate standing. A program of orientation, lectures, and workshops designed to enhance the Teaching Assistant's understanding of teaching methods in philosophy and to provide opportunities to work closely with experts in college teaching in order to improve the quality of instruction. Required of all new Teaching Assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PHIL 302. Teaching Practicum (1-4)** Prerequisite(s): employment as Teaching Assistant or Associate. Supervised teaching in lower-division courses and LWSO 100. Required of all teaching assistants in philosophy. Does not count toward the unit requirement for the M.A. degree. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**PHIL 400. Research and Professional Development Workshop (1)** Workshop, 8 hours per quarter; extra reading, 8 hours per quarter. Prerequisite(s): graduate standing. A series of presentations and workshops

focused on a variety of issues in research, professional development, and teaching. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 18 units.

## Physical Sciences

### College of Natural and Agricultural Sciences

The Physical Sciences major is not accepting new students at this time. For more information, contact the CNAS Undergraduate Academic Advising Center, 1223 Pierce Hall, or call (951) 827-7294.

## Physics and Astronomy

**Subject abbreviation: PHYS**

### College of Natural and Agricultural Sciences

Department Office, 3047 Physics  
(951) 827-5331; [physics.ucr.edu](mailto:physics.ucr.edu)

#### Professors

Kenneth N. Barish, Ph.D.  
Robert B. Clare, Ph.D.  
John A. Ellison, Ph.D.  
J. William Gary, Ph.D.  
Gail G. Hanson, Ph.D.  
Roland Kawakami, Ph.D.  
Ernest S. Ma, Ph.D.  
Allen P. Mills, Ph.D.  
Bahram Mobasher, Ph.D.  
Umar Mohideen, Ph.D.  
Richard K. Seto, Ph.D.  
Jing Shi, Ph.D.  
Harry W.K. Tom, Ph.D.  
Chandra M. Varma, Ph.D.  
Gillian Wilson, Ph.D.  
Stephen J. Wimpenny, Ph.D.  
Jose Wudka, Ph.D.  
Jory A. Yarmoff, Ph.D.

#### Professors Emeriti

Frederick W. Cummings, Ph.D.  
Bipin R. Desai, Ph.D.  
Sun-Yiu Fung, Ph.D.  
Peter E. Kaus, Ph.D.  
Anne Kernan, Ph.D.  
Nai-Li H. Liu, Ph.D.  
Donald C. McCollum, Ph.D.  
John C. Nickel, Ph.D.  
Douglas E. MacLaughlin, Ph.D.  
Raymond L. Orbach, Ph.D.  
Michael Pollak, Ph.D.  
Eugen S. Simanek, Ph.D.  
R. Stephen White, Ph.D.  
Allen D. Zych, Ph.D.

#### Associate Professors

Ward Beyermann, Ph.D.  
Mark Bockrath, Ph.D.  
E. Gabriela Canalizo, Ph.D.  
Chun Ning "Jeanie" Lau, Ph.D.  
Owen Long, Ph.D.  
Leonid P. Pryadko, Ph.D.  
Kirill Shtengel, Ph.D.  
Shan-Wen Tsai, Ph.D.  
Roya Zandi, Ph.D.

#### Assistant Professor

Vivek Aji, Ph.D.  
Naveen Reddy, Ph.D.  
Brian Siana, Ph.D.

## Major

The Department of Physics and Astronomy offers two degrees: the B.A. and B.S. in Physics. The **B.S. program** is designed for students with a strong interest in the sciences or engineering who wish to emphasize this aspect of their education and training. The B.S. degree provides a strong background for students who wish to continue on to graduate school.

The **B.A. program** follows the liberal arts tradition with a broader coverage of the humanities and social sciences. It is selected often by students who intend to obtain a teaching credential with a specialty in science or to pursue a career combining business management opportunities with a knowledge in science and technology.

The extensive course offerings and modern facilities within the Department of Physics and Astronomy, coupled with close, personal counseling by faculty advisors, provide students with a physics program that is characterized by its breadth and flexibility.

## Career Opportunities

Graduates with a bachelor's degree in Physics generally begin their careers in government or industry. Professions include research and development, system modeling and analysis, and sales in a large variety of fields. A Physics degree provides one of the most flexible qualifications with direct applications to materials science, advanced electronics, lasers and microwave devices, computing and communications.

The federal government and national laboratories employ many physicists as do industries in medical and scientific instruments, computers, audio and telecommunications equipment, financial analysis and investments, material science, and engineering.

The bachelor's degree programs in the UCR Department of Physics and Astronomy are well suited for continued education in graduate school and for preparation in technical and professional careers. Colleges or universities, national laboratories, industry, and governmental agencies employ students with graduate training.

## Transfer Students

Students transferring to the Physics major must complete courses comparable to the following one-year sequences before they transfer:

1. General physics (calculus-based) equivalent to PHYS 040A, PHYS 040B, PHYS 040C, each course completed with a grade of "C" or better
2. First-year calculus, equivalent to MATH 009A, MATH 009B, MATH 009C, each course completed with a grade of "B-" or better

At least one of the following one-year sequences:

1. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C, each course completed with a grade of "C" or better
2. Second-year calculus, equivalent to MATH 010A, MATH 010B, MATH 046, each course completed with a grade of "C" or better
3. Organic chemistry (one-year lower-division), each course completed with a grade of "B" or better

Students must have a minimum grade point average of 2.70 in transferable college courses. UCR has articulation agreements with most of the California community colleges. These agreements list specific community college courses that have been designated as comparable to UCR courses (see the statewide articulation Web site at [www.assist.org](http://www.assist.org)). Transfer students will usually find it advantageous to complete most or all sequences before starting at UCR. All prospective transfers should try to complete the sequences they begin rather than divide a sequence between two campuses.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

## Major Requirements

The major requirements consist of a core curriculum and additional requirements for various B.S. degrees. The core requirements for the B.A. and B.S. degrees in Physics are as follows:

1. Lower-division requirements (69 units)
  - a) one of the following sequences: PHYS 041A, PHYS 041B, PHYS 041C, or PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D, PHYS 040E. The first sequence is preferred for the B.S. in Physics.
  - b) PHYS 39
  - c) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
  - d) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 011A, CHEM 011B, CHEM 011C
  - e) CS 010
2. Upper-division requirements (46 units)
  - a) PHYS 130A, PHYS 130B, PHYS 132, PHYS 135A, PHYS 135B, PHYS 156A, PHYS 156B
  - b) PHYS 139L (5 units), PHYS 142L (5 units).

- c) 8 units of upper division Physics electives. Upper division math, science of engineering may be substituted with approval. A student may take up to a maximum of 4 units of undergraduate research (PHYS 195A, PHYS 195B, PHYS 195C, and/or PHYS 195D). This may include a Physics internship at an approved government or industrial laboratory, with approval.

#### Physics : Standard Track (B.S. degree)

- Additional upper-division requirements (21 units)
  - PHYS 133, PHYS 136
  - PHYS 142L (additional 5 units- 1 quarter). Approved undergraduate research (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D) in physics or an internship (PHYS 198-I) in physics at a government or industrial laboratory can be used in place of up to 5 units of PHYS 142L.
  - 8 additional units of upper division Physics electives. PHYS 156C is highly recommended for those planning to go to graduate school in physics.

#### Physics: Biophysics Track (B.S. degree)

- Additional lower-division requirements (12 units)
  - BIOL 005A, BIOL 005B, BIOL 005C, BIOL 05LA
- Additional upper-division requirements (24 units)
  - CHEM 112A, CHEM 112B which may be used to satisfy the core requirement 2c.
  - 16 additional upper division units taken from CHEM 112C, BCH 110A, BCH110B, BCH 110C or BIOL 107A (other upper division CHEM/BIOL/BCH may be substituted upon approval)

#### Physics Education Track (B.S. degree only)

- Additional lower-division requirements (10 units)
  - EDUC 003, EDUC 004
  - LING 020 or LING 021
- Additional upper-division requirements (17 units)
  - EDUC 110, EDUC 177A, and either EDUC 172 or EDUC 174.
- Upper division recommendations (4 units)
  - EDUC 104/MATH 104

#### Physics: Applied Physics and Engineering Track (B.S degree)

- Additional upper-division requirements (21 units)
  - PHYS 142L (additional 5 units- 1 quarter). Approved undergraduate research (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D) in physics or an internship (PHYS 198-I) in physics at a government or industrial laboratory can be used in

place of up to 5 units of PHYS 142L.

- 8 additional units of upper division Physics electives.
- 8 units of upper division Engineering electives.

Students seeking an emphasis in environmental physics or chemical physics should consult with an advisor. The physics electives may be selected on an individual basis to stress one of these concentrations.

Students continuing on to graduate school are encouraged to take additional upper-division courses in Mathematics, such as MATH 146A, MATH 146B, MATH 146C, MATH 165A, MATH 165B, and MATH 113.

Students may wish to earn a Minor in Mathematics which requires an additional 24 units of upper division math.

To graduate, a minimum grade point average of 2.00 (C) is necessary overall and in the upper-division courses taken for the major (courses listed under 2.).

#### Bachelor of Arts

For the B.A. degree, additional units are required in Humanities, Social Sciences, and foreign language to meet the breadth requirements.

#### Minor

The minor in Physics consists of 26 upper-division units in Physics. A minimum of 16 units must be unique to the minor and may not be used to satisfy major requirements.

- First Tier (16 units)
  - PHYS 130A
  - PHYS 132
  - PHYS 135A
  - One Upper Division Physics elective from PHYS 111, PHYS 150A, PHYS 151, PHYS 164, PHYS 165, PHYS 166, PHYS 177
- Second Tier: at least 10 units from any upper-division Physics courses not chosen in the First Tier. The combined units from the First and Second Tiers should add to at least 26.
- No more than 4 units of 190-199 courses may be used to fulfill the upper-division units for the minor.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

#### Community College Transfers

The department provides special advisory services to aid community college transfer students in formulating their program and in remedying any deficiencies in required course work. Transfer students who have followed the prescribed program at the community college should be able to continue with the sample

program at the junior level.

## Graduate Program

The Department of Physics and Astronomy offers the M.S. and Ph.D. degrees in Physics.

Ongoing research in the Department of Physics and Astronomy includes astrophysics and space physics, condensed matter physics, particle physics, heavy ion physics, surface science, laser physics, and environmental physics. Large-scale experiments are carried out at the major U.S. and European accelerator laboratories or observatories.

**Admission** All applicants must submit scores from the GRE General and Physics subject tests. Questions about requirements for admission should be directed to the graduate advisor at (951) 827-5332.

## Master's Degree

A student is recommended for the degree of M.A. or M.S. in Physics upon completion of the following requirements:

- Satisfactory completion of a minimum of 36 quarter units of approved physics courses taken for a letter grade after admission to graduate study. Of these, at least 24 quarter units must be in the 200 series. Each course must be passed with a grade of "B-" or better. Each student must maintain an average for all courses of "B" or better.
- Either of the following two plans:

**Plan I (Thesis)** Satisfactory completion of a thesis in a field of physics to be chosen in consultation with a faculty supervisor. This thesis is approved by a committee designated by the department.

**Plan II (Comprehensive Examination)** Satisfactory performance on the comprehensive examination.

Under either plan all requirements for the master's degree must be completed not later than the end of the sixth quarter.

**Normative Time to Degree** Six quarters

## Doctoral Degree

The Department of Physics and Astronomy offers the Ph.D. degree in Physics.

It is recommended that students in the Ph.D. program become associated with a research advisor by the end of Spring Quarter of their first year.

A student is recommended for advancement to candidacy for the Ph.D. degree in Physics upon completion of requirements (1), (2), and (3) below. The student is recommended for the Ph.D. degree upon completion of requirements (4) and (5) below.

- Course Work** Each course must be passed with a grade of "B-" or better. Each student must maintain an average of "B" or better for all courses.

1A. Core courses for students pursuing a program in Physics (other than Astronomy):

PHYS 205 (Classical Mechanics)  
 PHYS 210A, PHYS 210B, PHYS 210C (Electromagnetic Theory)  
 PHYS 212A, PHYS 212B (Thermodynamics and Statistical Mechanics)  
 PHYS 221A, PHYS 221B, PHYS 221C (Quantum Mechanics)  
 PHYS 296 (Summer Research in Physics and Astronomy)

1B. Core courses for students pursuing a specialization in Astronomy:

PHYS 205 (Classical Mechanics)  
 PHYS 210A, PHYS 210B, PHYS 210C (Electromagnetic Theory)  
 PHYS 212A (Thermodynamics and Statistical Mechanics, Part A)  
 PHYS 214 (Techniques of Observational Astrophysics)  
 PHYS 215 (Dynamics and Evolution of Galaxies)  
 PHYS 218 (Fundamentals of Astrophysics)  
 PHYS 219 (Cosmology and Galaxy Formation)  
 PHYS 296 (Summer Research in Physics and Astronomy)

In addition, students in both programs must complete at least three additional graduate lecture courses in the area of their specialization. Students pursuing program 1A should choose courses from section "a-f" below. Students pursuing program 1B should choose courses from section "g" below. The program for each student must be approved by the graduate committee and the student's research advisor. Such a program may entail more than the minimum number of courses, and may also involve a mixture of courses from different areas in addition to those in the lists below.

The elective courses include the following:

**a) Nuclear and Particle Physics**

PHYS 225A, PHYS 225B (Elementary Particles)  
 PHYS 230A, PHYS 230B (Advanced Quantum Mechanics and Quantum Theory of Fields)

**b) Condensed Matter, Surface, Biophysics and Optical Physics**

PHYS 209A, PHYS 209B (Introduction to Quantum Electronics)  
 PHYS 234 (Physics of Nanoscale Systems)  
 PHYS 235 (Spintronics and Nanoscale Systems)  
 PHYS 236 (Advanced Imaging Techniques)

PHYS 240A\*, PHYS 240B\*, PHYS 240C (Condensed Matter Physics)

PHYS 241A, PHYS 241B, PHYS 241C (Advanced Statistical Physics and Field Theory)

PHYS 242 (Physics at Surfaces and Interfaces)

PHYS 246 (Biophysics)

\*For specialization in this track, students are required to take PHYS 240A and PHYS 240B successively as two of their three additional courses.

**c) Astrophysics**

PHYS 203 (Statistical Astronomy)  
 PHYS 204 (Advanced Galaxy Formation and Cosmology)  
 PHYS 208 (General Relativity)  
 PHYS 211A (Radiative Processes in Astrophysics)  
 PHYS 211B (Astrophysical Fluid Dynamics)  
 PHYS 213 (Astrophysics of the Interstellar Medium)  
 PHYS 216 (Star Formation)  
 PHYS 217 (Stellar Structure and Evolution)

Additional astrophysics courses may be taken at other UC campuses through the Intercampus Exchange Program.

**d) Cosmology and Astroparticle Physics**

PHYS 203 (Statistical Astronomy)  
 PHYS 204 (Advanced Galaxy Formation and Cosmology)  
 PHYS 208 (General Relativity)  
 PHYS 225A, PHYS 225B (Elementary Particles)  
 PHYS 230A (Advanced Quantum Mechanics)  
 PHYS 226 (Cosmology)  
 PHYS 227 (Particle Astrophysics)

**e) Environmental Physics**

Two courses chosen from track (b) and two courses chosen from below:  
 SWSC 203 (Surface Chemistry of Soils)  
 SWSC 213 (Soil Mineralogy)  
 or other approved graduate-level courses in related fields.

**f) Materials and Nanoscale Physics**

Two courses chosen from track (b) and two additional approved courses from the departments of Chemistry, Chemical and Environmental Engineering, Mechanical Engineering, or Electrical Engineering.

**g) Astronomy**

PHYS 203 (Statistical Astronomy)  
 PHYS 204 (Advanced Galaxy Formation and Cosmology)

PHYS 208 (General Relativity)

PHYS 211A (Radiation)

PHYS 213 (Astrophysics of the Interstellar Medium)

PHYS 216 (Star Formation)

PHYS 217 (Stellar Structure and Evolution)

PHYS 226 (Cosmology)

**2. Written Comprehensive Examinations**

Students must have satisfactory performance on a comprehensive examination, to be taken at the end of the student's first year. In the event of a failure, a make-up exam is offered in the winter quarter of the second year. The comprehensive examination for students pursuing the physics program consists of an exam that covers Mechanics, Statistical and Thermal Physics, Quantum Mechanics, and Electromagnetism. The comprehensive examination for students pursuing the astronomy specialization consists of an exam that covers Mechanics, Statistical and Thermal Physics, Electromagnetism, and Fundamental Astrophysics.

**3. Oral Qualifying Examination in General Area of Proposed Research**

Satisfactory performance on an oral examination in the general area of the student's proposed research. This examination is conducted by a doctoral committee, charged with general supervision of the student's research. It is normally taken during the academic year following that in which the comprehensive examination requirement has been successfully completed. A student who fails this examination on the first attempt may, at the discretion of the committee, be permitted to take it a second time.

**4. Dissertation Examination** Students must complete a dissertation containing a review of existing knowledge relevant to the area of the candidate's research, and the results of the candidate's original research. This research must be of sufficiently high quality to constitute a contribution to knowledge in the subject area.

**5. Final Oral Examination** A final oral defense may be required.

**Normative Time to Degree** For students pursuing program 1A: 15 quarters for theoretical physics; 18 quarters for experimental physics; 17 quarters for specialization in environmental physics (theory); 20 quarters for specialization in environmental physics (experimental). For students pursuing the astronomy program, 1B: 18 quarters.

## Lower-Division Courses

*Only one of the following sequences, PHYS 002A, PHYS 002B, PHYS 002C, or PHYS 040A, PHYS 040B, PHYS 040C may be taken for credit.*

**PHYS 002A. General Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 008B with a grade of "C-" or better or MATH 009A with a grade of "C-" or better or MATH 09HA with a grade of "C-" or better. Covers topics in classical mechanics, including Newton's laws of motion in one and two dimensions; work, energy, and conservation of energy; momentum and collisions; rotational motion; and orbital motion. For biological sciences students. Credit is awarded for only one of PHYS 002A, PHYS 040A, or PHYS 041A.

**PHYS 002B. General Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B or MATH 09HB (may be taken concurrently); PHYS 002A with a grade of "C-" or better. Covers topics in mechanics, thermodynamics, and electromagnetism. Includes fluid mechanics; temperature and heat; the laws of thermodynamics; kinetic theory of gases; electric fields and potentials; current and DC circuits; capacitance and inductance; magnetism; and Faraday's law. For biological sciences students. Credit is not awarded for PHYS 002B if it has already been awarded for PHYS 041B or both PHYS 040B and PHYS 040C.

**PHYS 002C. General Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 002B with a grade of "C-" or better. Covers topics in waves and modern physics. Includes harmonic oscillations; mechanical and electromagnetic waves; geometrical optics; reflection, refraction, interference, diffraction, and polarization; and quantum, atomic, and nuclear physics. For biological sciences students. Credit is not awarded for PHYS 002C if it has already been awarded for PHYS 041C or both PHYS 040D and PHYS 040E.

**PHYS 005. History of the Universe (4)** Lecture, 3 hours; discussion, 1 hour. An introduction to "The Big Bang" model and its observational tests. Topics include dark energy, dark matter, rapid growth of universe at early times, leftover radiation from "The Big Bang", galaxy formation, bending of light by gravity, black holes, extraterrestrial life, and the likely fate of the universe.

**PHYS 006. The Violent Universe (4)** Lecture, 3 hours; discussion, 1 hour. An introduction to violent phenomena that power the universe, specifically phenomena that illustrate basic astrophysical principles. Topics include impacts in our planetary system: explosions of stars, bursts of star formation, galaxy collisions, black holes, quasars, cosmic jets, and the "Big Bang." Cross-listed with GEO 006.

**PHYS 007. Space-Time, Relativity, and Cosmology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A nontechnical presentation of the growth of modern science covering topics from Newton and gravitation, Kepler and the motion of celestial bodies, Einstein and relativity, and Planck and Bohr up to present theories on the origin and evolution of the universe. Explores the philosophical ideas, scientific method, historical settings, and intellectual impacts. Includes demonstrations and visual illustrations.

**PHYS 008. Color and Sound: Dimensions in Communication (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Discusses the interplay between visual and aural sensory experiences and the physical principles of light and sound. Topics include visual perception and pattern recognition; the color spectrum; optical instruments; anatomy of the camera and the eye; lasers and holography; vibrations and sound waves; acoustics; reverberation; and sound production in speech, music, and high-fidelity audio devices. Involves demonstrations and illustrations.

**PHYS 010. How Things Work (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Survey of the physical basis of modern technology, with an empha-

sis on electronics and electrical devices. Topics include electro- and magneto-statics and dynamics (xerographic copiers, magnetic levitation, electrical power distribution), communication (radio, TV, computers, tape recorders, CD players), and imaging (cameras, DVD players, x rays, magnetic resonance imaging).

**PHYS 012. The Big Bang: Forces in the Early Universe (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Explores our current understanding of the origins of the universe in a nontechnical manner using basic scientific literature. Topics include the "Scientific Process - How a Theory Comes to be," the fundamental forces of nature and their unification, the structure of the vacuum, and the beginning and end of the universe.

**PHYS 016. Principles of Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005 is recommended. Topics include classical laws of motion, force, energy, electricity and magnetism, properties of matter, atomic structure, waves, sound, light, heat, the Earth, and the solar system and universe. Includes demonstrations and visual illustrations. Not open to students with credit or concurrent enrollment in PHYS 002A, PHYS 002B, PHYS 002C, PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D, or PHYS 040E.

**PHYS 018. Energy and the Environment (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Applies the fundamental physics of energy sources and energy balance in the environment and to models of weather and the "Greenhouse Effect." Explores the environmental impact of solar, fossil fuel, and nuclear energy. Covers thermodynamics, energy and mass flow, and the limitations of modeling. Helps in making informed decisions about environmental issues.

**PHYS 020. Exploring the Universe: An Adventure in Astronomy (4)** Lecture, 3 hours; workshop, 3 hours. Prerequisite(s): none. An astronomy course for non-science students. The excitement of an evolving and sometimes violent universe of stars and galaxies is explored in a descriptive manner. Here, the union of modern and ancient observations with astrophysical laws will provide a sophisticated but by no means complete picture of the universe. Special topics such as Astrology and Extraterrestrial Life will be discussed.

**PHYS 021. Kingdom of the Sun (4)** Lecture, 3 hours; workshop, 3 hours. Prerequisite(s): none. An astronomy course for non-science students. The nearest star, our Sun, and its solar system of planets, moons, asteroids, and comets are presented in a descriptive manner. A historical astronomy of the solar system is traced from ancient concepts to modern space exploration. Special topics such as UFOs and colonization of space are discussed.

**PHYS 022. The Science in Science Fiction (4)** Lecture, 3 hours; screening, 1 hour; term paper, 1 hour; extra reading, 1 hour. Prerequisite(s): none. Covers the physics underlying various science fiction stories, books, television shows, and films. Provides a perspective for interpreting the (often misleading) information presented in the popular media, and highlights those aspects that are good science.

**PHYS 024. DNA in Your Life: The Physical Basis for Structure, Function, and Control (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to various medical, biological, and commercial aspects of physical DNA science.

**PHYS 021A. General Physics Laboratory (1)** Laboratory, 3 hours. Prerequisite(s): PHYS 002A (may be taken concurrently). Illustrates the experimental foundations of physics presented in PHYS 002A. Covers the basic principles of classical mechanics. Laboratory is helpful, but not required, for PHYS 002A.

**PHYS 021B. General Physics Laboratory (1)** Laboratory, 3 hours. Prerequisite(s): PHYS 002A with a grade of "C-" or better, PHYS 021A, PHYS 002B (PHYS 002B may be taken concurrently). Illustrates the experimental foundations of physics presented in PHYS 002B. Covers the basic principles of fluid and rotational mechanics, temperature, heat, and electromagnetism. Laboratory is helpful, but not required, for PHYS 002B.

**PHYS 021C. General Physics Laboratory (1)** Laboratory, 3 hours. Prerequisite(s): PHYS 002B with a grade of "C-" or better, PHYS 021B, PHYS 002C (PHYS 002C may be taken concurrently). Illustrates the experimental foundations of physics presented in PHYS 002C. Covers the basic principles of oscillations, waves, optics, and radioactivity. Laboratory is helpful, but not required, for PHYS 002C.

**PHYS 039. Adventures in Physics (2)** Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): none. General introduction to frontiers of physics research. Introduces the outstanding issues in physics research, along with work of UC Riverside faculty. Tours of the research labs. Graded Satisfactory (S) or No Credit (NC).

**PHYS 040A. General Physics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 008B with a grade of "C-" or better or MATH 009A with a grade of "C-" or better or MATH 09HA with a grade of "C-" or better; MATH 009B or MATH 09HB (MATH 009B or MATH 09HB may be taken concurrently). Designed for engineering and physical sciences students. Covers topics in classical mechanics including Newton's laws of motion; friction; circular motion; work, energy, and conservation of energy; dynamics of particle systems; collisions; rigid-body motion; torque; and angular momentum. Laboratories provide exercises illustrating experimental foundations of physical principles and selected applications. Credit is awarded for only one of PHYS 002A, PHYS 040A, or PHYS 041A.

**PHYS 040B. General Physics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 009C or MATH 09HC (may be taken concurrently); PHYS 040A with a grade of "C-" or better. Designed for engineering and physical sciences students. Covers topics in mechanics and thermodynamics including elasticity; oscillations; gravitation; fluids; mechanical waves and sound; temperature, heat, and the laws of thermodynamics; and the kinetic theory of gases. Laboratories provide exercises illustrating the experimental foundations of physical principles and selected applications.

**PHYS 040C. General Physics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 009C or MATH 09HC; PHYS 040B with a grade of "C-" or better. Designed for engineering and physical sciences students. Covers topics in electricity and magnetism including electric fields and potential; Gauss' law; capacitance; magnetic fields; Ampere's law; Faraday's law and induction; electromagnetic oscillations; dc and ac current; and circuits. Laboratories provide exercises illustrating the experimental foundations of physical principles and selected applications. Credit is awarded for only one of PHYS 040C or PHYS 041B.

**PHYS 040D. General Physics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): PHYS 040C with a grade of "C-" or better or consent of instructor. For engineering and physical sciences students. Topics in electromagnetic waves including Maxwell's equations; geometrical optics; optical instruments, cavities, and waveguides; interference, diffraction, and polarization; and special theory of relativity. Laboratories provide exercises illustrating the experi-

mental foundations of physical principles and selected applications. Credit is not awarded for PHYS 040D if it has already been awarded for PHYS 041C.

**PHYS 040E. General Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046 (may be taken concurrently); PHYS 040D with a grade of "C-" or better. For engineering and physical sciences students. Covers topics in modern physics including the quantum theory of light and particles; quantum mechanics in one and three dimensions; tunneling phenomena; the hydrogen atom; statistical physics; lasers; molecular structure; and solid state, nuclear, and particle physics. Credit is not awarded for PHYS 040E if it has already been awarded for PHYS 041C or both PHYS 002C and PHYS 040D.

#### **PHYS 041A. Introductory Physics for Physics**

**Majors (8)** Lecture, 4 hours; discussion, 2 hours; laboratory, 6 hours. Prerequisite(s): MATH 009A with a grade of "C-" or better or MATH 09HA with a grade of "C-" or better (MATH 009A or MATH 09HA may be taken concurrently). Covers topics in classical mechanics, including Newton's laws of motion in one and two dimensions; work, energy, and conservation of energy; momentum and collisions; rotational motion; and orbital motion. Credit is awarded for only one of PHYS 002A, PHYS 040A, or PHYS 041A.

#### **PHYS 041B. Introductory Physics for Physics**

**Majors (8)** Lecture, 4 hours; discussion, 2 hours; laboratory, 6 hours. Prerequisite(s): MATH 009B with a grade of "C-" or better or MATH 09HB with a grade of "C-" or better (MATH 009B or MATH 09HB may be taken concurrently); PHYS 002A with a grade of "B" or better or PHYS 040A with a grade of "B" or better or PHYS 041A with a grade of "C-" or better or consent of instructor. Covers relativity oscillations, mechanical waves, fluids, electrostatics, magnetism, and circuits. Credit is awarded for only one of PHYS 040C or PHYS 041B.

#### **PHYS 041C. Introductory Physics for Physics**

**Majors (8)** Lecture, 4 hours; discussion, 2 hours; laboratory, 6 hours. Prerequisite(s): MATH 009C with a grade of "C-" or better or MATH 09HC with a grade of "C-" or better (MATH 009C or MATH 09HC may be taken concurrently); PHYS 002B with a grade of "B" or better or PHYS 040C with a grade of "B" or better or PHYS 041B with a grade of "C-" or better or consent of instructor. Covers electromagnetism, geometric and wave optics, and modern physics. Credit is not awarded for PHYS 041C if it has already been awarded for both PHYS 002C and PHYS 040D or both PHYS 040D and PHYS 040E.

**PHYS 097. Lower-Division Research (1-4)** Individual study, 3-12 hours. Prerequisite(s): consent of instructor. Special research projects in physics performed under the supervision of a member of the staff. This course may not be used to satisfy the undergraduate unit requirements in the major. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

## Upper-Division Courses

#### **PHYS 111. Astrophysics and Stellar Astronomy (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B, MATH 046, or equivalents; one of the following: PHYS 040D with a grade of C- or better, PHYS 041C with a grade of C- or better, PHYS 002C with a grade of B+ or better. Covers stellar interiors, radiations, and evolution; the origin of the elements; particle and electromagnetic radiation; pulsars, quasars, and other unusual objects; and galactic structure and cosmology.

**PHYS 130A. Classical Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C, MATH 010A (may be taken concurrently); one of the following: PHYS 002A with a grade of B+ or better, PHYS 040A with a grade of C- or better, PHYS 041A with a grade of C- or better. Topics include vector calculus, single-particle motion, oscillations, Lagrangian and Hamiltonian dynamics, central-forces motion, and celestial mechanics.

**PHYS 130B. Classical Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A, MATH 010B (may be taken concurrently), PHYS 130A. Topics include dynamics of a system of particles, motion in non-inertial reference systems, dynamics of rigid bodies, coupled oscillations, and special theory of relativity.

**PHYS 132. Thermodynamics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 010B; MATH 046 (may be taken concurrently); PHYS 130B. Covers thermodynamic systems, heat, work, laws of thermodynamics, and formal mathematical relations. Credit is awarded for only one of PHYS 132 or PHYS 134.

**PHYS 133. Statistical Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156B. Covers statistical mechanics, ensembles, and classical and quantum statistical mechanics. Explores the connection between statistical mechanics and thermodynamics. Credit is awarded for only one of PHYS 133 or PHYS 134.

**PHYS 134. Thermal Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B; one of the following: PHYS 002C with a B+ or better, PHYS 040E with a C- or better, PHYS 041C with a C- or better. Covers macroscopic properties of many-particle systems. Examines laws and applications of thermodynamics (entropy, thermodynamic potentials, and ideal gases). Addresses principles and applications of statistical mechanics including probability distributions; canonical, microcanonical, and grand canonical ensembles; specific heat of solids; paramagnetism; kinetic theory of gases; phase transitions; and quantum statistics. Credit is not awarded for PHYS 134 if it has already been awarded for PHYS 132 or PHYS 133.

**PHYS 135A. Electromagnetism (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B; MATH 046; one of the following: PHYS 040C with a C- or better, PHYS 041B with a C- or better, PHYS 002B with B+ or better. Topics include vector calculus; Coulomb's law and the electric field; Gauss' law; scalar potential; conductors in electrostatic fields; electrostatic energy; electric multipoles; boundary conditions; electrostatics in the presence of matter; and special methods in electrostatics.

**PHYS 135B. Electromagnetism (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 135A. Topics include electric currents and circuits, Ampere's law, the magnetic field, the integral form of Ampere's law, the vector potential, Faraday's law of induction, magnetic energy, magnetic multipoles, magnetism in the presence of matter, Maxwell's equations, and plane waves.

**PHYS 136. Electromagnetic Waves (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 135B. Covers Maxwell's equations; propagation of electromagnetic waves in wave guides, coaxial lines, and optical fibers; reflection, refraction, and diffraction of waves; dispersion of waves in gases and plasmas; interference and coherence and their role in holography; electromagnetic radiation from charged particles,

antennas, masers, and lasers; and relativistic electrodynamics.

**PHYS 139L. Electronics for Scientists (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): One of the following: PHYS 002B with B+ or better, PHYS 040C with a C- or better, PHYS 041B with a C- or better, or consent of instructor. Introduces basic analog and digital circuit designs that emphasize practical applications. Includes properties of diodes and transistors; operational amplifiers for use as amplifiers, oscillators, and function generators; properties and use of logic gates, counters, and timers; data storage and synchronization; multiplexer and decoder applications; microprocessor functions; and computer interfacing.

#### **PHYS 142L. Advanced Physics Laboratory (5)**

Laboratory, 15 hours. Prerequisite(s): one of the following: PHYS 002C with a grade of B+ or better, PHYS 040E with a grade of C- or better, PHYS 041C with a grade of C- or better; upper-division standing in Physics; consent of advisor. Consists of experiments chosen from areas in contemporary physics. Course is repeatable to a maximum of 10 units.

**PHYS 145A. Biophysics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C or CHEM 01HC; MATH 010B; MATH 046; one of the following: PHYS 041C with a C- or better, PHYS 040E with a C- or better, PHYS 002C with B+ or better. . Covers physical modeling of the structure of proteins; protein folding; structure of nucleic acids; electrostatic potential of DNA; dynamics of biomolecules; structure of a biological cell; osmotic pressures of cells; non-equilibrium thermodynamics; and biochemical reactions.

**PHYS 145B. Biophysics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 145A; BCH 100 or BCH 110B; or consent of instructor. Covers conformation of biopolymers, intermolecular forces, dynamics of biopolymers, Brownian motion, biopolymers as polyelectrolytes, electrolytic solutions, and the Debye-Huckel theory.

**PHYS 145C. Biophysics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 145B or consent of instructor. Examines stochastic thermodynamics; the Fluctuation Theorems and the Jarzynski relation; protein and RNA denaturation; tests of the Jarzynski relation; chemical forces and self-assembly; enzymes and molecular machines; survey of molecular devices found in cells; and kinetics of real enzymes and machines.

#### **PHYS 150A. Introduction to Condensed Matter**

**Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): One of the following: PHYS 002B with B+ or better, PHYS 040E with a C- or better, PHYS 041C with a C- or better; or consent of instructor. Covers properties of systems composed of many atoms arranged in a periodic lattice. Topics include crystal structure, symmetry, and diffraction; crystal cohesion; lattice dynamics; thermal properties; metallic properties and the Fermi surface; band theory of metals and semiconductors; and collective excitations.

#### **PHYS 150B. Introduction to Condensed Matter**

**Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 150A. Covers properties of systems composed of many atoms arranged in a periodic lattice. Topics include superconductivity; magnetism; non-crystalline solids; defects in solids; surface and interface physics; and alloys.

#### **PHYS 151. Topics in Modern Condensed Matter**

**Research (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): One of the following: PHYS 002B with B+ or better, PHYS 040E with a C- or better, PHYS 041C with a C- or better. Consent of instructor is required for students repeating the course. Introduces

cutting-edge physics research being conducted in laboratories and institutes around the world. Focuses on a single research area (e.g., nanoscale physics, biological physics) that may change each quarter. Includes experimental methods and theoretical concepts. Course is repeatable as content changes to a maximum of 12 units.

**PHYS 152A. Exploring Many-Body Quantum Physics with Mathematica (2) W** Lecture, 2 hours.

Prerequisite(s): MATH 046; one of the following: PHYS 002C with a B+ or better, PHYS 040E with a C- or better, PHYS 041C with a C- or better; or consent of instructor. MATH 113 is recommended. An introduction to numerics and visualization using Mathematica. Topics include random numbers and stochastic processes; time-dependent and stationary equations in matrix form; single-particle tight-binding model; single-spin dynamics; pure and mixed states; spin echo; the direct product of matrices; many-body quantum mechanics; and quantum spin chains.

**PHYS 152B. Exploring Many-Body Quantum Physics with Mathematica (2)** Lecture, 2 hours.

Prerequisite(s): PHYS 152A or consent of instructor. Covers the symmetry of many-body wavefunction, including bosons and fermions; secondary quantization; harmonic oscillators; ladder operators, eigenvalues, and eigenfunctions; interacting many-body systems; mean field approximation; and density matrix of a subsystem and decoherence.

**PHYS 156A. Quantum Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B, MATH 046 (may be taken concurrently); one of the following: PHYS 002C with a grade of B+ or better, PHYS 040E with a grade of C- or better, PHYS 041C with a grade of C- or better. . Topics include wave-particle duality, the Schrödinger equation, superposition, the uncertainty principle, and one-dimensional harmonic oscillator.

**PHYS 156B. Quantum Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156A. Topics include the hydrogen atom, angular momentum and spin representations, many-electron systems, the Pauli exclusion principle, and perturbation theory.

**PHYS 156C. Quantum Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156B. Applications in quantum mechanics. Includes perturbation theory and other approximations, scattering, and an introduction to advanced topics such as relativistic quantum mechanics.

**PHYS 163. Atomic Physics and Spectroscopy (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 113 or equivalent; one of the following: PHYS 002A with a grade of B+ or better, PHYS 040A with a grade of C- or better, PHYS 041A with a grade of C- or better; or consent of instructor. Covers fine structure and spin-orbit coupling in single-electron atoms; angular momentum coupling and magnetic moments in many-electron atoms; Hartree-Fock solution to many-electron problem; hyperfine structure; atoms in the various electromagnetic fields; the two-level atom; electron spin and nuclear magnetic resonance spectroscopy; laser spectroscopy; and fundamentals of chemical bonding in molecules.

**PHYS 164. Introduction to Nuclear Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): One of the following: PHYS 002C with a grade of B+ or better, PHYS 040E with a grade of C- or better, PHYS 041C with a grade of C- or better. Addresses the basic nuclear properties, as well as the nuclear building blocks and structure. Explores radioactivity, nuclear interactions, the strong force, the confinement and chiral phase transitions, the quantum chromodynam-

ics (QCD) vacuum, and matter at extreme temperatures and densities.

**PHYS 165. Introduction to Particle Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156A. Explores the classification of particles in terms of the Standard Model. Includes methods and techniques for particle acceleration and detection; conservation laws and symmetries; the basic interactions of particles (electromagnetic, strong, weak); and electroweak unification.

**PHYS 166. Cosmology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156A. Discusses current topics in astrophysics and cosmology from the perspective of elementary particle physics. Topics include the development and structure of the early universe, dark matter and dark energy, cosmic radiation, and particle physics in the stars.

**PHYS 168. Environmental Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046; PHYS 040C; one of the following: CHEM 110B, both PHYS 040D and PHYS 040E both with a grade of C- or better, PHYS 041C with a grade of C- or better. Covers the application of physics to environmental problems. Includes global climate, energy for human use, transport of pollutants, noise, environmental spectroscopy, and the evaluation of environmental issues in the context of society.

**PHYS 177. Computational Methods for Physical Sciences (4)** Lecture, 3 hours; laboratory, 3 hours.

Prerequisite(s): one of the following: PHYS 002C with a grade of B+ or better, PHYS 040E with a grade of C- or better, PHYS 041C with a grade of C- or better. Covers computer applications for solving problems in physical sciences. Addresses symbolic manipulation languages such as Mathematica, mathematical operations, plotting, and symbolic and numerical techniques in calculus. Includes numerical methods such as histogramming, the Monte-Carlo method for modeling experiments, statistical analysis, curve fitting, and numerical algorithms. Prior computer knowledge not required.

**PHYS 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): consent of department chair. Individual study to meet special curricular needs. May not be used to satisfy major requirements unless taken as a replacement for a course not being offered during the student's remaining tenure. Students who take the course as a substitute for PHYS 142L receive a letter grade; other students may petition for a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 9 units; a maximum of 3 units may be used to substitute for PHYS 142L.

**PHYS 190L. Special Studies at Los Alamos National Laboratory (1-8)** Individual study, 3-24 hours.

Prerequisite(s): admission to the UCR/LANL Educational Internship Program; consent of advisor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 16 units.

**PHYS 195A. Senior Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): senior standing; consent of instructor.

A thesis written on research conducted under the supervision of a faculty member. May be undertaken as a one-, two-, three-, or four-quarter course (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D). Total credit awarded for PHYS 195A plus PHYS 195B plus PHYS 195C plus PHYS 195D may not exceed 8 units; a maximum of 4 units may be used to satisfy the unit requirement for the major, and a maximum of 3 units of any combination of PHYS 195A, PHYS 195B, PHYS 195C, and PHYS 195D may be used to substitute for PHYS 142L. Graded In Progress (IP) until the

last quarter is completed, at which time a final grade is assigned; a Satisfactory (S) or No Credit (NC) grade is awarded unless the course is taken to substitute for PHYS 142L.

**PHYS 195B. Senior Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): senior standing; consent of instructor; PHYS 195A. A thesis written on research conducted under the supervision of a faculty member. May be undertaken as a one-, two-, three-, or four-quarter course (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D). Total credit awarded for PHYS 195A plus PHYS 195B plus PHYS 195C plus PHYS 195D may not exceed 8 units; a maximum of 4 units may be used to satisfy the unit requirement for the major, and a maximum of 3 units of any combination of PHYS 195A, PHYS 195B, PHYS 195C, and PHYS 195D may be used to substitute for PHYS 142L. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned; a Satisfactory (S) or No Credit (NC) grade is awarded unless the course is taken to substitute for PHYS 142L.

**PHYS 195C. Senior Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): senior standing; consent of instructor; PHYS 195B. A thesis written on research conducted under the supervision of a faculty member. May be undertaken as a one-, two-, three-, or four-quarter course (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D). Total credit awarded for PHYS 195A plus PHYS 195B plus PHYS 195C plus PHYS 195D may not exceed 8 units; a maximum of 4 units may be used to satisfy the unit requirement for the major, and a maximum of 3 units of any combination of PHYS 195A, PHYS 195B, PHYS 195C, and PHYS 195D may be used to substitute for PHYS 142L. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned; a Satisfactory (S) or No Credit (NC) grade is awarded unless the course is taken to substitute for PHYS 142L.

**PHYS 195D. Senior Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): senior standing; consent of instructor; PHYS 195C. A thesis written on research conducted under the supervision of a faculty member. May be undertaken as a one-, two-, three-, or four-quarter course (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D). Total credit awarded for PHYS 195A plus PHYS 195B plus PHYS 195C plus PHYS 195D may not exceed 8 units; a maximum of 4 units may be used to satisfy the unit requirement for the major, and a maximum of 3 units of any combination of PHYS 195A, PHYS 195B, PHYS 195C, and PHYS 195D may be used to substitute for PHYS 142L. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned; a Satisfactory (S) or No Credit (NC) grade is awarded unless the course is taken to substitute for PHYS 142L.

**PHYS 197. Research for Undergraduates (1-4)**

Individual study, 3-12 hours. Prerequisite(s): upper-division standing and consent of instructor. Special research projects in physics performed under the supervision of a member of the staff. This course may not be used to satisfy the undergraduate unit requirement in the major. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

**PHYS 198-I. Individual Internship in Physics (1-12)**

Written work, 1-12 hours; internship, 2-24 hours. Prerequisite(s): upper-division standing; consent of department chair. Provides experience as a practicing scientist in a government or industrial laboratory. The student is jointly supervised by an off-campus sponsor and a Physics faculty member. Requires a written, final report. Graded Satisfactory (S) or No Credit (NC) unless taken to substitute for PHYS 142L. Course is repeatable to a maximum of 12 units; a maximum of

4 units may be used to satisfy major requirements, and a maximum of 3 units may be used to substitute for PHYS 142L.

## Graduate Courses

### **PHYS 202. Interdisciplinary Overview of Current Issues in Semiconductor Processing (3)** Lecture, 3 hours.

Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. An interdisciplinary overview of present-day semiconductor processing. Introduces topics such as properties of semiconductors, cleanroom environment, epitaxy, ion implantation, etching, lithography, device architecture, testing, and fault detection. May offer field trips. Cross-listed with CHEM 208 and MSE 245D.

### **PHYS 203. Statistical Astronomy (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 218.

Introduces statistical methods needed to analyze astronomical data. Provides case examples of problems in observational astronomy and applies statistical techniques to solve them. Covers probability, correlation and association, hypothesis testing, data modeling, maximum likelihood technique, detection and surveys, sequential data, and surface distribution.

### **PHYS 204. Advanced Galaxy Formation and Cosmology (4)** Lecture, 3 hours; discussion, 1 hour.

Prerequisite(s): PHYS 218 and PHYS 219. Covers topics on galaxy formation, star formation in galaxies, intergalactic medium, first generation of stars and galaxies, high redshift Universe, dark matter and dark energy, and big bang chronology and nucleosynthesis. Also introduces new techniques and the latest data sets and data archives used for research.

**PHYS 205. Classical Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Physics. Covers the Lagrangian formulation, calculus of variations, Hamilton's principle, conservation principles and symmetry properties, the two-body central force problem, the Kepler problem, and scattering. Also examines orthogonal transformations, rigid body motion, the inertia tensor, Euler's equations, Hamiltonian formulation, canonical transformations, and complex integration.

**PHYS 208. General Relativity (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 205. Tensors, covariant derivative, the Riemann curvature tensor and Einstein's equation. The Schwarzschild metric and applications to the solar system and black holes. Gravity waves and expanding universe.

**PHYS 209A. Quantum Electronics (4)** Lecture, 4.5 hours. Prerequisite(s): PHYS 134, PHYS 135A, PHYS 135B, PHYS 156A; or consent of instructor. Quantum theory of light and interaction of light with atoms. Density matrix formulation of atomic susceptibility. Propagation of light in matter and optical waveguides. Optical resonators. Theory and operation of common lasers. Letter grades are assigned to students whose research is related to atomic, molecular, or optical physics. Other students receive either a letter or Satisfactory (S) or No Credit (NC) grade.

**PHYS 209B. Nonlinear Optics (4)** Lecture, 4.5 hours. Prerequisite(s): PHYS 209A or consent of instructor. Wave propagation in nonlinear media. Electro-optic effect, three- and four-wave mixing, high-resolution nonlinear spectroscopies, rare atom and molecule detection, laser manipulation of particles, high-intensity laser physics, laser-plasma interactions. Letter grades are assigned to students whose research is related to atomic, molecular, or optical physics. Other

students receive either a letter or Satisfactory (S) or No Credit (NC) grade.

**PHYS 210A. Electromagnetic Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Covers topics in electrostatics, including Coulomb potential, boundary value problems, multipoles, and dielectric media. Also addresses Laplace's equation and Green's function in Cartesian, spherical, and cylindrical coordinates.

**PHYS 210B. Electromagnetic Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 210A; graduate standing; consent of instructor. Covers topics in electromagnetism. Includes magnetostatics, quasistationary electromagnetism, Maxwell's equations, gauge transformations, Maxwell's stress tensor, analyticity of dielectric susceptibility, and electromagnetic waves in uniform media and waveguides.

**PHYS 210C. Electromagnetic Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 210B or consent of instructor. Covers electromagnetic radiation and scattering; propagation of electromagnetic fields in non-uniform media (geometrical optics, interference, and diffraction); special theory of relativity; Lagrangian formalism; and dynamics of relativistic particles in external fields. Also examines Cherenkov radiation and magnetic monopoles.

### **PHYS 211A. Radiative Processes in Astrophysics (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 135A, PHYS 135B, PHYS 136, PHYS 156A, PHYS 156B. Radiative transfer of continuum and line radiation, Einstein coefficients, photoionization equilibria, radiation by free electrons, bremsstrahlung and synchrotron emission, Compton and inverse Compton scattering, wave propagation through magnetized plasmas, atomic and molecular structure and spectra, atomic fine structure, and molecular hyperfine lines. Letter grades are assigned to students whose research is related to astrophysics. Other students receive either a letter or Satisfactory (S) or No Credit (NC) grade.

**PHYS 211B. Astrophysical Fluid Dynamics (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 211A. Covers hydrodynamics, sound waves, turbulence, supersonic turbulence, magnetohydrodynamics, Alfvén waves, extragalactic relativistic jets, supersonic jets, galactic spiral structure and density-wave theory, accretion disk theory, Balbus-Hawley instability, and stellar winds. Students whose research is related to astrophysics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

### **PHYS 212A. Thermodynamics and Statistical Mechanics (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Covers thermodynamics, statistical mechanics, ideal Bose systems, ideal Fermi systems, and bulk motion. Cross-listed with MSE 204.

### **PHYS 212B. Thermodynamics and Statistical Mechanics (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 204/PHYS 212A; graduate standing; consent of instructor. Addresses functional integrals and approximation techniques. Provides an introduction to phase transitions and the renormalization group.

### **PHYS 213. Astrophysics of the Interstellar Medium (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. An overview of the interstellar medium and relevant physical processes. Covers the structure and evolution of ionized hydrogen regions associated with massive stars and supernovae. Also addresses the neutral and ionized phases of the interstellar medium, as well as cooling processes. Includes

the interpretation of spectral lines. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

### **PHYS 214. Techniques of Observational Astrophysics (4)**

Lecture, 2 hours; laboratory, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing. An introduction to the basic tools of observational astronomy. Topics include astronomical telescopes and detectors, observing techniques, calibration, and error analysis. Students whose research is related to astronomy receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

### **PHYS 215. Dynamics and Evolution of Galaxies (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Discusses the structure, stability, and dynamic and cosmologic evolution of galaxies. Interprets observational data on galaxies within a coherent theoretical framework. Topics include potential theory, orbits, collisionless systems, and the structure and evolutionary history of galaxies. Students whose research is related to astronomy receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

### **PHYS 216. Star Formation (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Discusses the processes involved in the formation of stars: the initial conditions in the interstellar medium that leads to star formation and the formation of planets and planetary systems around young stars. Topics include molecular cloud formation, the properties of young stars, jets and outflows, massive stars, and cosmological star formation. Students whose research is related to astronomy receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

### **PHYS 217. Stellar Structure and Evolution (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Topics include physics of stellar structure and main sequence evolution, and energy production and transport; postmain sequence evolution through the giant stage and the formation of compact objects; supernovae, nucleosynthesis, pulsars, and the roll of accretion within the framework of stellar evolution; and the physics of white dwarfs, neutron stars, and black holes. Students whose research is related to astronomy receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

### **PHYS 218. Fundamentals of Astrophysics (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Develops basic astrophysical concepts from fundamental physics. Topics include nucleosynthesis, stellar structure, evolution of stars of different masses, end-states of stars, and bremsstrahlung and synchrotron radiation. Also covers cross-sections, opacities, hydrogen atom transitions, forbidden lines, and molecular lines. Addresses the ongoing search of life in the Universe. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

### **PHYS 219. Cosmology and Galaxy Formation (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Topics include cosmology, models for the universe, galaxy formation scenarios, evolution of galaxies and stellar population, and number counts. Also covers luminosity functions, correlation function and clustering, star formation activity in the universe, cosmic background radiation, dark matter, and dark energy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**PHYS 221A. Quantum Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Examines the fundamental concepts of quantum mechanics including wave functions and the uncertainty relations. Also covers time dependence of quantum systems, such as the simple harmonic oscillator and simple two-level systems.

**Desai**

**PHYS 221B. Quantum Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221A; graduate standing; consent of instructor. Covers angular momentum and approximation methods, including perturbation theory.

**PHYS 221C. Quantum Mechanics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221B; graduate standing; consent of instructor. Covers symmetries in quantum mechanics, identical particles, and scattering theory.

**PHYS 225A. Elementary Particles (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 221A, PHYS 221B, PHYS 221C; or consent of instructor. Provides an overview of particle physics. Topics include Quantum Electrodynamics (QED), the Quark-Parton Model, and Quantum Chromodynamics (QCD). Also discusses experimental techniques for particle detection and energy measurement. Students whose research is related to high-energy physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 225B. Elementary Particles (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 225A or consent of instructor. Explores the fundamental concepts and techniques of nanoscale physics such as the Standard model, Charge-Parity (CP) violation and conservation laws, and mixing in the neutral strange and bottom meson systems. Students whose research is related to high-energy physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 226. Cosmology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; PHYS 208. Discusses advanced topics in cosmology: Friedmann models and the large-scale structure of the universe, Hubble constant and deceleration parameter, and galaxy counting and the physics of the early universe. Also covers vacuum phase transitions, inflation, baryon number generation, fluctuations, topological defects and textures, primordial nucleosynthesis, density fluctuations, dark matter candidates, and the age of the universe. Students whose research is related to cosmology or astroparticle physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 227. Particle Astrophysics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; PHYS 226. An introduction to current research in particle astrophysics: the very early universe, the origin of matter, primordial perturbations, the origin of structure, the nature of dark matter, vacuum energy, matter-antimatter asymmetry, neutrino astrophysics, gravitational radiation, black holes, the origin of ultrahigh energy cosmic rays, and Hawking radiation. Students whose research is related to cosmology or astroparticle physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 230A. Advanced Quantum Mechanics and Quantum Theory of Fields (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 221A, PHYS 221B, PHYS 221C; or consent of instructor. Topics include quantization of fields for particles with spins 0, 1/2, and 1; path integrals; Feynman diagrams; and

scattering amplitude and cross sections. Students whose research is related to quantum mechanics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 230B. Advanced Quantum Mechanics and Quantum Theory of Fields (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 230A or consent of instructor. Explores renormalization of quantum field theory, gauge invariance, spontaneous breaking of gauge symmetry, Quantum Chromodynamics, and electroweak interactions. Students whose research is related to quantum mechanics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 230C. Advanced Quantum Mechanics and Quantum Theory of Fields (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 230B or consent of instructor. A study of current topics in quantum field theory, including solitons and instantons, supersymmetry, and the unification of all forces. Students whose research is related to quantum mechanics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 231. Methods of Theoretical Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. A study of analytic functions, Cauchy's theorem, Taylor series, Laurent series expansions, the residue theorem, and analytic continuation.

**PHYS 234. Physics of Nanoscale Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores the fundamental concepts and techniques of nanoscale physics, including nanoscale fabrication and characterization techniques, electronic properties in reduced dimensions, properties of carbon nanotubes, nanoelectromechanical systems, superconductivity in reduced dimensions, and nanophotonics. Students whose research is related to materials and nanoscale systems physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. Cross-listed with MSE 234A.

**PHYS 235. Spintronics and Nanoscale Magnetism (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of contemporary issues in nanoscale magnetism and spin-dependent phenomena in solids, including the fundamentals of magnetism, magnetism in reduced dimensions, novel magnetic materials, spin-polarized transport, spin coherence in semiconductors, magnetization dynamics, and device applications. Students whose research is related to materials and nanoscale systems physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. Cross-listed with MSE 234B.

**PHYS 236. Advanced Imaging Techniques (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers advanced fabrication and characterization techniques of nanoscale materials, structures, and devices, including lithographic methods (top-down approach), self-assembling growth of nanowires and nanocrystals, scanned probe microscopy, and electron microscopy. Students whose research is related to materials and nanoscale systems physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 240A. Condensed Matter Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221C; graduate standing or consent of instructor. Topics include classical and quantum theories of the electron gas; crystal and reciprocal lattices; X-ray diffraction; crystal symmetries; electrons in a periodic

potential; nearly free electrons; tight binding; semiclassical dynamics; and semiclassical transport. Students whose research is related to condensed matter physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. Cross-listed with MSE 214.

**PHYS 240B. Condensed Matter Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 240A or consent of instructor. Topics include measuring the Fermi surface, band structure, electron scattering, electron-electron interactions, surface effects, classification of solids, cohesive energy, classical and quantum harmonic crystals, and phonon dispersion relations. Students whose research is related to condensed matter physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 240C. Condensed Matter Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 240B or consent of instructor. Topics include anharmonic phonon effects, phonons in metals, dielectric properties, homogeneous and inhomogeneous semiconductors, defects, diamagnetism, paramagnetism, magnetic interactions, magnetic ordering, and superconductivity. Students whose research is related to condensed matter physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 240D. Advanced Solid State Physics (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 240C. Discusses the techniques of group theory and symmetry considerations applied to solid state physics. Uses these techniques to analyze and develop the theory and experiments of ferro and anti-ferromagnetism, ferroelectricity, spintronics, and correlated fermions. Students whose research is related to solid state physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 241A. Advanced Statistical Physics and Field Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; PHYS 212B or consent of instructor; PHYS 221C or consent of instructor. PHYS 240A, PHYS 240B, and PHYS 240C are recommended. Topics include elementary excitations in many-body systems, critical phenomena and the renormalization group technique, Green's functions and Feynman diagrams, and other field-theory techniques, and advanced topics in condensed matter physics. Students whose research is related to condensed matter physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 241B. Advanced Statistical Physics and Field Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; PHYS 241A. Topics include advanced field-theory techniques applied to many-body systems, exactly soluble classical and quantum models in one and two dimensions, quantum Hall effect, and other advanced topics in condensed matter physics. Students whose research is related to condensed matter physics receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 241C. Advanced Statistical Physics and Field Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; PHYS 241B. Topics include quantum magnetism, unconventional superconductivity, localization, transport phenomena, mesoscopic systems, nonequilibrium phenomena, and advanced field-theory methods, such as methods for treating disorder. Students whose research is related to condensed matter physics receive a letter grade;

other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**PHYS 242. Physics at Surfaces and Interfaces (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Overview of surface science, electronic and geometric structure of clean surfaces, techniques for investigating structure, electron spectroscopy of surfaces, adsorption on surfaces, vibrations on surfaces, and epitaxial growth and applications of surface science. Letter grades will be assigned to students whose research is related to surface physics. Other students will receive either a letter or Satisfactory (S) or No Credit (NC) grade.

**PHYS 246. Biological Physics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 134 or consent of instructor. Introduces topics at the interface of physics and biology: cell physiology, probability and information, diffusion, random walks, electrostatics, elasticity of biopolymers and membranes, DNA topology, friction in fluids, and low Reynolds numbers. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**PHYS 251. Techniques of Observational Astronomy (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Covers major areas necessary for the successful completion of an observational program, from the choice and preparation of telescope time proposals, to the actual data acquisition and reduction, to the analysis and publication of results. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Canalizo**

**PHYS 252. Topological Phases in Condensed Matter and Their Applications to Quantum Computing (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. A study of topological order and fractionalization emergent in the systems of strongly correlated electrons, as well as their applications, in particular those related to quantum information processing. Covers frustrated quantum magnets, fractional quantum Hall effect, and related gauge theories. Discusses use of topologically ordered states for performing fault-tolerant quantum computations. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Shtengel**

**PHYS 253 (E-Z). Special Topics (3)**

Seminar, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Additional prerequisites may be required for segments of this course; see department. Discusses subjects such as magnetohydrodynamics, astrophysics, and high-energy physics. Graded Satisfactory (S) or No Credit (NC). Some segments of this course may be repeatable; see Department. **Zych**

**PHYS 254. Statistical Physics in Biology (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Introduces students to the evolving field of biological physics. Topics include random walks, self-assembly, nucleation theory, scaling laws in polymer physics, mechanical properties of biopolymers, protein-DNA, and protein-protein interactions. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Zandi**

**PHYS 255. Spin-Dependent Phenomena in Solids (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Topics include spin-dependent transport and tunneling in magnetic multilayers and tunnel junctions, spin injection and detection in inorganic and organic semiconductors, spin transfer torque in nanomagnets, and their technological appli-

cations. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Shi**

**PHYS 256. Advances in Nanoscale Physics (1 or 2)**

Seminar, 1 hour; individual study, 0-3 hours. Prerequisite(s): graduate standing. Seminars on current topics in nanoscale physics and materials science, including nanoelectronic devices, nanoelectromechanical systems, nanoscale biophysics, spintronics, nanoscale magnetism, nanophotonic systems, and advanced characterization techniques. Students who give class presentations receive credit for 2 units; other students receive credit for 1 unit. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PHYS 257. Topics in Interacting Many Body Systems (2) F, W, S**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Studies the effect of correlation, interaction, and disorder in many body systems. Topics include the emergence of new states of matter, as well as quantum phase transition and novel phenomena in topical systems such as unconventional superconductors, itinerant magnets, and disordered thin films. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Aji**

**PHYS 258. Seminar in Surface Science (1)**

Seminar, 1 hour. Prerequisite(s): graduate standing in Physics or Chemistry or consent of instructor. Oral presentations by participating visiting scholars, postdoctoral researchers, students, and UCR faculty on current research topics in surface science. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with CHEM 258. **Yarmoff**

**PHYS 259. Techniques of Observational Cosmology (2) F, W, S**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Covers major areas necessary for the successful completion of a Ph.D. in observational cosmology. Includes review of current literature; choice and preparation of telescope time proposals; data acquisition and reduction; analysis and publication of results; and presentations at workshops and conferences. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Wilson**

**PHYS 260. Selected Topics in Theoretical High-Energy Physics (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Topics include the physics of the Standard Model and its extensions; anomalies, spontaneous symmetry breaking, and phenomenology; and cosmological effects of new particles. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Wudka**

**PHYS 261. Theory of Strongly Correlated Low-Temperature Systems (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Topics include quantum transport with disorder and interactions, quantum effect, high-temperature superconductivity, and low-dimensional systems. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Pryadko**

**PHYS 262. Electron Spin and Magnetism in Nanostructures (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Topics include synthesis of new materials and hybrid nanos-

tructures, molecular beam epitaxy and magnetism dynamics, ultrafast optical spectroscopy, spin transport in molecular electronic devices, and sample characterization by atomic force microscopy and transmission electron microscopy. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Kawakami**

**PHYS 263. The Yukawa Sector Beyond the Standard Model (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Covers recent research in determining the quark masses and weak mixing angles through the properties of the Yukawa mass matrices at scales higher than the Standard Model scale. Topics include texture zeroes and their possible origin, renormalization group equations, and the role of the condensate mechanism. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Desai**

**PHYS 264. Strongly Correlated and Nanoscale Systems (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Discusses current topics of research, including properties of materials and nanostructures with strong electronic correlations. Covers theoretical approaches to the study of effects of interaction and disorder in quantum many-body systems and the additional effects of surfaces, interfaces, and constrained geometry in nanoscale systems. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Tsai**

**PHYS 265. DNA Computation (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Involves elementary manipulations on DNA molecules with use of various enzymes, separation techniques, and detection methods and their applications to simple DNA molecular analog neural networks and autonomous reactions. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Mills**

**PHYS 266. Theoretical Aspects of Fundamental Particle Interactions (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Covers electroweak symmetry breaking and the origin of mass; conservation laws and physics beyond the Standard Model; and new theoretical ideas and their possible applications. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Ma**

**PHYS 267. Hadron Physics at Electron-Positron Colliders (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Covers phenomenology of electroweak and strong interactions in electron-positron collisions; experimental results; and techniques for investigating the properties and interactions of quarks, gluons, leptons, and the W and Z gauge bosons at high energy e<sup>+</sup>e<sup>-</sup> accelerators. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Gary**

**PHYS 268. Electroweak Physics at Electron-Positron Colliders (2)**

Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. The study of the electroweak interaction at high-energy e<sup>+</sup>e<sup>-</sup> colliders. Covers properties of the Z and W bosons. Emphasis is placed on the high precision tests of the Standard Model. Includes comparisons with similar tests in other reactions. Students who present a seminar or submit a paper receive a letter grade; other students

receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Clare**

**PHYS 269. Physics and Electronics in Nanoscale Systems (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Discusses current topics of research including electrical, mechanical, and magnetic properties of nanoscale systems and possible device applications. Examples include superconducting and semiconducting nanowires, carbon nanotubes, and molecule-based nanostructures. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Lau**

**PHYS 270. Magnetic Resonance Techniques in Condensed Matter Physics (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Introduces research graduate students to two or three topics in the following areas: nuclear magnetic resonance, muon spin rotation ( $\mu$ SR), and heavy-fermion materials. Topics are selected to correspond to the experience and interests of the students. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **MaLaughlin**

**PHYS 271. Heavy Ion Physics (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. A study of Heavy Ion collisions at high energies. Surveys experimental data and examines theoretical expectations for the production of the quark-gluon plasma. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Seto**

**PHYS 272. High Transverse Momentum Physics at Hadron Colliders (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. A review of current research in both the current and future generation of hadron colliders. Discusses experiments, with an emphasis on high transverse momentum and rare processes and the search for new particles. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Wimpenny**

**PHYS 274. Experimental Relativistic Nucleon-Nucleon Collisions (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Survey of experimental methods used by current relativistic nucleon-nucleon collision detectors at Brookhaven National Laboratory and CERN. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Barish**

**PHYS 276. Experimental Aspects of Electroweak Symmetry Breaking (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Investigation of experimental techniques and current limits on the origins of electroweak symmetry breaking. Includes examination of the Standard Model and extensions of the Standard Model. Topics include comparison of various production schemes: hadron colliders, electron-positron colliders, and muon colliders. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Hanson**

**PHYS 277. Special Topics in the Theory of Condensed Matter (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Discusses current topics of research including the theory of high temperature superconductivity, the quantum Hall effect, spintronics, and singular Fermi liquids. Students who

present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Varma**

**PHYS 278. Surface Sciences (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Topics include geometrical and electronic structure at surfaces and interfaces; chemical reactions on surfaces; interactions of radiation with surfaces; mechanisms of film growth on surfaces; and development of novel surface science analytical techniques. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Yarmoff**

**PHYS 279. Astrophysics (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Topics include measurements of gamma rays from pulsars and other cosmic sources, measurements of gamma rays and neutrons from the sun, and laboratory magnetosphere and comet experiments. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Zych**

**PHYS 280. Space Physics and Astrophysics (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Topics include the large-scale structure of the heliosphere, the physics of the interplanetary and interstellar medium, and particle acceleration and transport. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Zank**

**PHYS 281. Charge-Parity (CP) Symmetry Violation (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Provides an overview of charge-parity (CP) symmetry violation, mostly from an experimental point of view. Reviews the theoretical background and discusses experimental results and their implications. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Long**

**PHYS 282. Experimental Investigations of Strongly Correlated Materials (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Examinations of thermodynamic and transport properties in strongly correlated materials which often exhibit unusual broken-symmetry ground states. Topics include measurements of specific heat, resistivity, magnetoresistivity, thermopower, and the Hall effect of existing and previously uncharacterized compounds. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Beyermann**

**PHYS 283. Techniques of Microscopy (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Explores current techniques of microscopy. Covers optical and electron microscopy and novel techniques of scanning microscopy such as scanning tunneling microscopy, near-field scanning optical microscopy, and atomic force microscopy. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Mohideen**

**PHYS 284. Optical Techniques for Measurements in Physics (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Explores current topics in optical physics and the use of optical and nonlinear optical techniques to make measurements of interest in atomic, molecular, chemical, and condensed matter physics. Emphasizes advances in sci-

ence enabled by advances in laser technology. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Tom**

**PHYS 285. Experimental Techniques in Particle Physics (2)** Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Review of experimental techniques used in particle physics experiments, including tracking, calorimetry, and muon detection. Analysis of experiments at future supercolliders and their physics capabilities, focusing on the searches for the Higgs, top quark physics, and supersymmetric particles. Students who present a seminar or submit a paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. **Ellison**

**PHYS 288. Current Research Themes in Physics (2) F** Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduces first-year graduate students to current issues in physics research at UCR. Involves seminars by faculty on their research and interaction with advanced students and postdoctoral researchers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PHYS 289. Colloquium in Physics (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Specialized discussions by visiting scientists, faculty, and students on current research topics in physics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. **Chair in charge**

**PHYS 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor; consent of advisor or Department Chair. Individual study, directed by a faculty member, of specially selected topics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PHYS 291. Individual Study in Coordinated Areas (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Faculty-assisted programs of individual study for candidates who are preparing for examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable within the following limits: Up to 6 units may be taken prior to award of the Master's degree, such units to be in addition to minimum unit requirements for the degree. Up to 12 additional units may be taken (continued) prior to advancement to candidacy for the Ph.D.

**PHYS 296. Summer Research in Physics (2) Summer** Outside research, 12-20 hours. Prerequisite(s): graduate standing. Introduces first-year graduate students to current issues in physics research at UCR. Involves mentoring by faculty on research and interaction with advanced students and postdoctoral researchers. Offered in summer only. Graded Satisfactory (S) or No Credit (NC).

**PHYS 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Original research, in an area selected for the advanced degree, performed under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PHYS 299. Research for Thesis or Dissertation (1-12)** Thesis, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. Original research, in an area selected for the advanced degree, performed under the direction of a faculty member. This research is to be included as a part of the dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

### PHYS 301. Teaching of Physics at the College Level (2)

Lecture, 2 hours. Prerequisite(s): graduate standing in Physics or consent of instructor. Required of all Teaching Assistants in the Department. Designed to introduce effective methods for teaching physics and to evaluate and improve teaching skills. Topics covered include lecture techniques, effective visual aids, improving laboratory and recitation section learning situations. Credit not applicable toward degree course requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. **Chair in charge**

**PHYS 302. Teaching Practicum (1-4)** Consultation, 1 hour; laboratory, 3-12 hours; practicum, 3-12 hours. Prerequisite(s): Appointment as a departmental Teaching Assistant; graduate standing. Supervised teaching in Physics courses and regular consultation with faculty supervisor(s) regarding teaching responsibilities. Credit not applicable toward degree course requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units. **Chair in charge**

### PHYS 401. Scientific Writing and Illustration (1)

Lecture, 1 hour. Prerequisite(s): consent of instructor. The research notebook. The thesis. References. The form of a technical article. Figures and slides. Patent requirements. Periodical requirements. Graded Satisfactory (S) or No Credit (NC).

## Plant Biology

See Botany and Plant Sciences  
(Graduate Program)

## Plant Pathology and Microbiology

**Subject abbreviation: PLPA**  
**College of Natural and Agricultural Sciences**

Michael F. Allen, Ph.D., Chair  
Department Office, 1463 Boyce Hall  
(800) 735-0717 or (951) 827-4116  
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### Professors

James E. Adaskaveg, Ph.D.  
Michael F. Allen, Ph.D. (Plant Pathology/Biology)  
Katherine A. Borkovich, Ph.D.  
James G. Borneman, Ph.D.  
Michael D. Coffey, Ph.D.  
Donald A. Cooksey, Ph.D.  
Shou-Wei Ding, Ph.D.  
Howard S. Judelson, Ph.D.  
A. L. N. Rao, Ph.D.  
Michael E. Stanghellini, Ph.D. *Cy Mouradick Chair in Desert Agriculture*

### Professors Emeriti

Salomon Bartnicki-Garcia, Ph.D.  
J. Allan Dodds, Ph.D.  
Joseph W. Eckert, Ph.D.  
Donald C. Erwin, Ph.D.  
Dennis D. Focht, Ph.D.  
John A. Menge, Ph.D.  
Donald E. Munnecke, Ph.D.  
Howard Ohr, Ph.D.

Alberto O. Paulus, Ph.D.  
Joseph S. Semancik, Ph.D.  
James J. Sims, Ph.D.  
Peter H. Tsao, Ph.D.  
Seymour D. Van Gundy, Ph.D. (Plant Pathology/  
Nematology)  
Lewis G. Weathers, Ph.D.

### Associate Professor

Hailing Jin, Ph.D.

### Assistant Professors

Greg Douhan, Ph.D.  
Wenbo Ma, Ph.D.  
James Ng, Ph.D.  
Caroline Roper, Ph.D.  
Jason E. Stajich, Ph.D.

\*\*

### Lecturers

Akif Eskalen, Ph.D.  
Deborah Mathews, Ph.D.  
Georgios Vidalakis, Ph.D.

### Affiliated Faculty

James Baldwin, Ph.D. (Nematology)  
Ellis F. Darley, Ph.D. (Plant Pathologist Emeritus)  
Thomas Eulgem, Ph.D. (Botany and Plant Sciences)  
Steven Garnsey, Ph.D. (Citrus Virology)  
Isgouhi Kaloshian, Ph.D. (Nematology)  
Philip Roberts, Ph.D. (Nematology)  
Linda Walling, Ph.D. (Botany and Plant Sciences)

## Undergraduate Curriculum

The Department of Plant Pathology and Microbiology participates in the Microbiology and Botany and Plant Sciences major leading to the baccalaureate degree. See the Microbiology or Botany and Plant Sciences section of this catalog.

## Graduate Program

The Department of Plant Pathology and Microbiology offers the M.S. and Ph.D. degrees in Plant Pathology.

**Admission** In addition to meeting the requirements for admission to the Graduate Division, students typically have a baccalaureate major in a biological science or training equivalent to that given in the Plant Science curriculum of the College of Natural and Agricultural Sciences. Majors in the physical sciences are welcomed, but students must be prepared to augment their undergraduate preparation with courses in the biological sciences. All applicants must provide GRE General Test scores (verbal, quantitative, analytical).

All candidates for the M.S. or the Ph.D. degree should have good basic preparation in chemistry and biology. It is common for students to have completed courses in biochemistry, organic chemistry, cell and molecular biology, elementary college mathematics, general physics, general botany, microbiology, statistics, genetics, plant physiology, mycology, and plant pathology. If these courses have been completed as an undergraduate, graduate study is facilitated. If students have not completed these courses prior to admission, they may be required to take them early in their graduate career.

## Master's Degree

The Department of Plant Pathology and

Microbiology offers the M.S. degree in Plant Pathology.

General university requirements are given in the Graduate Studies section of this catalog. The master's degree in Plant Pathology is offered under Plans I or II.

**Plan I (Thesis)** requires 36 units of upper-division and graduate courses, of which at least 24 must be in the 200 series courses in Plant Pathology or Nematology. A maximum of 12 units may be in graduate research for the thesis.

**Plan II (Comprehensive Examination)** requires 36 units of upper-division and graduate courses, of which at least 18 must be in the 200-series courses in Plant Pathology or Nematology, excluding graduate research for a thesis or dissertation, and a comprehensive final examination in the major subject.

The departmental graduate advisory committee, in consultation with the student's major professor or curriculum advisor, is responsible for prescribing the course of study, which normally includes as a minimum PLPA 200, PLPA 203, PLPA 204, PLPA 206/NEM 206, and participation in PLPA 250.

## Doctoral Degree

The Department of Plant Pathology and Microbiology offers the Ph.D. degree in Plant Pathology.

In accord with the student's preparation and specific interests, the departmental graduate advisory committee, in consultation with the student's major professor or curriculum advisor, prescribes areas where study is required. In addition to selected subjects in plant pathology, related fields in which some degree of competence may be expected is drawn normally from biochemistry, biology, chemistry, cell and molecular biology, entomology, genetics, mathematics, microbiology, nematology, plant physiology, soils, and statistics.

The departmental graduate advisory committee, in consultation with the student's major professor or curriculum advisor, is responsible for prescribing the course of study.

**Course Work** The course of study normally includes, as a minimum, PLPA 200, PLPA 203, PLPA 204, PLPA 206/NEM 206, and participation in PLPA 250.

### Written and Oral Qualifying Examinations

Students must demonstrate to the departmental graduate advisory committee, by written and oral examination, adequate preparation in the fields fundamental to plant pathology and in any area in which students have placed special emphasis in their training. A written dissertation research proposal is to be prepared before the qualifying examination and defended during the oral examination. After successful completion of the qualifying examination and all other formal requirements to the satisfaction of the dean of the Graduate Division, the student is advanced to candidacy for the Ph.D. degree.

**Dissertation and Final Oral Examination** A dis-

sertation is required of every candidate. The dissertation must be approved by the dissertation committee before the candidate may take the final oral examination. The final oral examination deals primarily with defense of the dissertation and its relation to the field in which its subject lies.

**Normative Time to Degree** 18 quarters

## Lower-Division Course

**PLPA 010. Microbes and Society: A Window into the Microbial World around Us (4) F** Lecture, 3 hours; extra reading, 3 hours. An introduction to the remarkable diversity and biology of microorganisms. Emphasizes the areas microorganisms impact human affairs, including food production, agriculture, medicine, and history. Includes cheese-, yogurt-, wine-, beer- and bread-making; the Irish potato famine; tulipomania; antibiotics; mushrooms and mushroom lore; food preservation; microbial toxins and food poisoning; and vaccines and useful viruses. **Douhan, Ng**

## Upper-Division Courses

**PLPA 120. Introduction to Plant Pathology (3) F** Lecture, 3 hours. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. An introduction to the study of plant diseases. Topics include diseases and disease-causing agents, pathogen interaction during disease development, and strategies for disease management. An optional, separate laboratory is offered. Cross-listed with BIOL 120 and MCBL 120. **Stanghellini**

**PLPA 120L. Introduction to Plant Pathology Laboratory (1) F** Laboratory, 4 hours. Prerequisite(s): BIOL 005A, BIOL 005B; concurrent enrollment in BIOL 120/MCBL 120/PLPA 120 or consent of instructor; BIOL 121/MCBL 121 and BIOL 124/MCBL 124 recommended. Covers fundamentals in the use of laboratory instruments and techniques for the detection, isolation, and identification of representative infectious agents that cause disease in plants. Cross-listed with BIOL 120L and MCBL 120L.

**PLPA 123. Introduction to Comparative Virology (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor. Considers viruses as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Compares the major groups of viruses to each other with respect to their biological and biochemical properties, molecular and genetic characteristics, and modes of replication. Cross-listed with BIOL 123 and MCBL 123. **Rao**

**PLPA 125. Pesticides, Biological Organisms, and the Environment (3)** Lecture, 3 hours. Prerequisite(s): two of the following Biology courses: BIOL 005A, BIOL 005B, BIOL 005C; CHEM 112A or CHEM 112B or CHEM 112C. An introduction to the chemistry, mode of action, and use of insecticides, acaricides, herbicides, and biopesticides from discovery to environmental interactions. Includes genetics of pesticide resistance development and government regulation. Cross-listed with ENTM 125 and ENTX 125. **Miller**

**PLPA 134. Introduction to Mycology (3) F** Lecture, 3 hours. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, one course in statistics; or consent of instructor.

Introduction to the morphology, taxonomy, genetics, physiology, ecology, and economic importance of the major groups of the fungi. Cross-listed with BIOL 134. **Adaskaveg**

**PLPA 134L. Introduction to Mycology Laboratory (1) F** Laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, or equivalents; concurrent enrollment in BIOL 134/PLPA 134; or consent of instructor. Introduces fundamentals in the use of laboratory instruments and techniques for the isolation, cultivation, and identification of representatives of the major taxa of fungi. Cross-listed with BIOL 134L. **Adaskaveg**

**PLPA 190. Special Studies (1-5)** Prerequisite(s): consent of instructor. To be taken as a means of meeting special curricular problems.

**PLPA 197. Research for Undergraduates (1-4)** Prerequisite(s): consent of instructor. Individual research in plant pathology performed under the guidance of members of the staff.

## Graduate Courses

**PLPA 200. Fungal Diseases of Plants (4) W, Even Years** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 134/PLPA 134 or consent of instructor. A study of important fungal diseases of plants, including biology of development of pathogens, host-parasite relations, and survival strategies. Emphasis will be on disease physiology, epidemiology, etiology, and control measures including breeding for resistance and chemical and biological control. **Coffey**

**PLPA 201. Functional Diversity of Prokaryotes (3)** Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BIOL 121/MCBL 121; or equivalents; or consent of instructor. In-depth coverage of bacterial and archaeal bioenergetics, cell structure, diversity of metabolism, regulation of metabolism, growth, and biosynthesis, and cell-cell interactions between prokaryotes and eukaryotes. Project involves analysis of metabolic pathways from complete, annotated, prokaryotic genome sequences. Cross-listed with ENSC 205 and MCBL 201.

**PLPA 203. Bacterial Diseases of Plants (4) W, Odd Years** Lecture, 2 hours; laboratory, 6 hours. An extensive introduction to bacterial diseases of plants, including: symptomatology, epidemiology, diagnosis, control, and the physiology and biochemistry of plant-bacterial interactions. **Ma, Roper**

**PLPA 204. Viral Diseases of Plants (4) S, Even Years** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 120/MCBL 120/PLPA 120 or consent of instructor. A study of viral diseases of plants and the agents causing them. Topics include historical developments, symptomatology, transmission, epidemiology, management, and classification of viruses pathogenic to plants. Special emphasis placed on the molecular nature of the pathogens and the processes of pathogenesis. **Ng, Matthews**

**PLPA 205. Signal Transduction Pathways in Microbes and Plants (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in the biological sciences, BIOL 107A or BIOL 113 or BIOL 114 or CBNS 101; or consent of instructor. Advanced topics in signal transduction pathways that regulate growth and development in plants and prokaryotic and eukaryotic microbes. Areas covered include two-component reg-

ulatory systems; quorum sensing; signaling via small and heterotrimeric G proteins; mitogen-activated protein kinase cascades; cAMP signaling; photoreceptors; plant hormone signaling; responses to low-oxygen stress; calcium signaling; and plant pathogenesis. Cross-listed with BCH 205, BPSC 205, CMDB 205, GEN 205, and MCBL 205. **Borkovich, Cutler, Eulgem, Kaloshian, Roper, Yang**

**PLPA 206. Phytopathogens: Nematodes (2) S, Odd Years** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Recognition, diagnosis, biology, and control of major nematode diseases of plants. Laboratory covers identification techniques, soil sampling and processing techniques, and process of pathogenesis. Cross-listed with NEM 206. **Baldwin, Roberts**

**PLPA 219. Molecular Plant Virology (3)** Lecture, 3 hours. Prerequisite(s): PLPA 204. Molecular biology of plant, animal, and bacterial viruses and viroids with emphasis on plant viruses; replication strategies; evolution; genetics; viruses as genetic vectors; and recombination. **Rao**

**PLPA 220. Advanced Mycology (4) F, Even Years** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 134/PLPA 134 or equivalent; graduate standing. Provides an in-depth examination on topics in fungal biology. Includes aspects of the ecology, pathology, genetics, and evolution of fungi. **Douhan**

**PLPA 226. Microbial Genetics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102. In-depth coverage of the genetics of microbes. Emphasizes the primary data and the foundation of modern techniques using viruses, archaea, prokaryotes, and eukaryotes. Includes genome sequences and organization, plasmids and other vectors, and mutation and genetic screens. Also covers transposable elements, recombination, and regulation of gene expression, development, and pathogenesis. Cross-listed with BIOL 221 and MCBL 221. **Borkovich**

**PLPA 230. Molecular Plant-Microbial Interactions (3) F, Odd Years** Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120/MCBL 120/PLPA 120, or equivalents. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with BPSC 230, CMDB 230, and GEN 230. **Jin, Kaloshian**

**PLPA 235. Epidemiology of Plant Disease (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 120/MCBL 120/PLPA 120. An introduction to the study of plant disease epidemics and their management. Topics will include: temporal, spatial, and genetic aspects of disease development in plant populations; assessment and prediction of disease and crop loss; inoculum density-disease relationships; and modeling. **Adaskaveg**

**PLPA 240. Field Plant Pathology (1) F** field trips. Prerequisite(s): consent of instructor. This course will deal with diagnosis of plant disease in the field, collection methods, identification of pathogens, and control methods. Graded Satisfactory (S) or No Credit (NC).

**PLPA 241. Special Topics (2)** Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Oral presentations and intensive small-group discussion of selected topics in each faculty member's area of specialization. Course content emphasizes recent advances in the special topic area and varies accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with MCBL 241.

**PLPA 245. Field Mycology (1)** field trips.

Prerequisite(s): BIOL 134/PLPA 134 or consent of instructor. This course will deal with observation, collection and identification of fungi both in the field and the laboratory. Graded Satisfactory (S) or No Credit (NC).

**PLPA 246. Diagnosis of Plant Disease (2) W** Lecture, 1 hour; laboratory, 1 hour; field, 2 hours.

Prerequisite(s): graduate standing or consent of instructor. Field trips to observe symptomology of diseases in nature, identification by laboratory and greenhouse tests, approaches to control, culture practices for major California crops, and influences of crop management on disease development.

**PLPA 250. Seminar in Plant Pathology (1)** Seminar, 1 hour.

Reports and discussions of selected topics in plant pathology by graduate students. Graded Satisfactory (S) or No Credit (NC).

**PLPA 260. Current Research in Plant Pathology (1)**

Seminar, 1 hour. Prerequisite(s): graduate standing. Topics in plant pathology will be discussed by outstanding workers in the field from this and other campuses and by graduate students. Graded Satisfactory (S) or No Credit (NC).

**PLPA 261. Seminar in Genetics, Genomics, and Bioinformatics (1)**

Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, BPSC 261, ENTM 261, and GEN 261.

**PLPA 265. A Colloquium on the Principles of Plant Pathology (3)**

Lecture, 3 hours. Prerequisite(s): advanced standing in the program. Faculty members will rotate as leaders in structured discussions leading to a synthesis of concepts from other courses, the heterogeneity of plant pathology as a scientific discipline, and its unifying principles. Graded Satisfactory (S) or No Credit (NC).

**PLPA 290. Research or Study on Special Topics by Individual Graduate Students (1-6)**

Outside research, 1-6 hours. Prerequisite(s): graduate status. This course is designed to allow graduate students to study an area or areas not covered by formal course work under a professor who will direct the amount and judge the quality of the work. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PLPA 291. Individual Study in Coordinated Areas (1-6)**

Outside research, 1-6 hours. Prerequisite(s): graduate status. A program of study designed to advise and assist candidates who are preparing for examinations. A student may take up to 12 additional units prior to successful completion of the Ph.D. qualifying examination. Graded Satisfactory (S) or No Credit (NC).

**PLPA 297. Directed Research (1-6)**

Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Political Science

Subject abbreviation: POSC

College of Humanities, Arts, and Social Sciences

Shaun Bowler, Ph.D., Chair  
Department Office, 2206 Watkins Hall

(951) 827-5312; [politicalscience.ucr.edu](http://politicalscience.ucr.edu)

**Professors**

Shaun Bowler, Ph.D.  
John C. Laursen, Ph.D.  
David S. Pion-Berlin, Ph.D.  
Georgia Warnke, Ph.D.

**Professors Emeriti**

Francis M. Carney, Ph.D.  
Max Neiman, Ph.D.  
Frank Way, Ph.D. (Political Science/Religious Studies)

**Associate Professors**

Julianne E. Allison, Ph.D.  
Benjamin Bishin, Ph.D.  
John W. Cioffi, Ph.D.  
Kevin M. Esterling, Ph.D.  
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P. Martin Johnson, Ph.D.  
Bronwyn A. Leebaw, Ph.D.  
Ronald O. Loveridge, Ph.D.  
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**Assistant Professors**

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Farah Godrej, Ph.D.  
Jana Grittersova, Ph.D.  
Yuhki Tajima, Ph.D.

## Majors

The Political Science Department offers undergraduate majors leading to B.A. degrees in Political Science, Political Science/Administrative Studies, Political Science/International Affairs, Political Science/Law and Society, and Political Science/Public Service. In addition, the department offers minors in Political Science and International Relations.

**Counseling** Counseling on graduation and departmental requirements and on enrollment is handled in the department office by the student affairs staff.

For more information about the undergraduate programs, call or write the Department of Political Science, (951) 827-5502 or (951)827-5312.

**Political Science Major**

The study of political science provides undergraduates with career opportunities in law, government service, education, journalism, and business. Because career goals may vary, the department offers two distinct majors. For students planning careers in such areas as law, journalism, or teaching, the traditional major in Political Science is appropriate. For students considering careers in government service, especially for such positions as program and budget analyst, urban planner, and executive or administrative assistant, the appropriate major is the Political Science/Public Service major.

Further information on the study of law or the legal profession may be obtained from the departmental prelaw counselor.

**Political Science/Administrative Studies Major**

The Political Science/Administrative Studies major combines the disciplinary interests of political science with a particular focus on administrative behavior, tools of decision making,

and politics of public policy. The Administrative Studies component provides an interdisciplinary approach to training in administrative analytical skills and, more importantly, to the study of the policies, politics, and theories of public administration. The Business Administration courses provide a variety of perspectives on these objectives. In addition, they should be of particular value to those planning to either enter directly into public administration (federal, state, or local levels) or attend a professional school of administration.

**Political Science/International Affairs Major**

The Political Science/International Affairs major offers a challenging opportunity to observe and participate in the dynamics of global interaction. As versatile as it is valuable, a degree in international affairs prepares the student for work in many diverse careers in the private sector, government, and academia. From diplomatic missions to the United Nations to intense debate with a private "think tank," careers in international affairs should appeal to students seeking to understand and influence the world in which we live.

**Political Science/Law and Society Major**

The Political Science/Law and Society major combines the breadth of a political science major with a particular focus on the theme of law and law-like relationships. The major provides a multidisciplinary approach to the study of legal and law-like institutions and relationships and focuses on relationships that have formed the core of political science: the emergence and development of law, the relationship between law and values, and the growth of the power of the state, among others. The courses provide a variety of perspectives on this theme, and the range of courses should be of particular benefit to those who plan to attend law school.

**Political Science/Public Service Major**

The Political Science/Public Service major introduces students to knowledge and skills associated with managerial career positions in government, without sacrifice of either a broad knowledge of politics or a liberal arts education.

**University Requirements**

See Undergraduate Studies section.

**College Requirements**

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The Political Science Department offers undergraduate majors leading to B.A. degrees in Political Science, Political Science/Administrative Studies, Political Science/International Affairs, Political Science/Law and Society, and Political Science/Public Service.

### Political Science Major

The major requirements for the B.A. degree in Political Science are as follows:

1. Lower-division requirements (four courses [at least 20 units]): one course from a, b, c, and d.

Students in the major must complete two of the four lower-division Political Science courses with a grade of "C" or better in order to take upper-division Political Science courses.

- a) POSC 005 or POSC 005H or POSC 005W or POSC 007
- b) POSC 010 or POSC010H
- c) POSC 015 or POSC 015H or POSC 017
- d) POSC 020 or POSC 020H

Upper-division requirements (nine courses [at least 40 units])

- a) One course from each of the following areas:
  - (1) U.S. Government and Politics: POSC 100, POSC 101, POSC 108, POSC 143, POSC 144 or POSC 144S, POSC 145, POSC 146, POSC 148 or POSC 148H or POSC 148S, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 172/URST 172, POSC 173 or POSC 173S, POSC 180 or POSC 180S, POSC 181, POSC 182, POSC 183, POSC 184 or POSC 184S, POSC 186
  - (2) Comparative Government and Politics: POSC 120, POSC 131, POSC 133, POSC 151, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 162/LNST 142, POSC 163 or POSC 163S, POSC 164 or POSC 164S, POSC 178 or POSC 178S.
  - (3) International Relations and Foreign Policy: POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126, POSC 127, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 134 or POSC 134S, POSC 135, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 169
  - (4) Political Theory: POSC 106 or POSC 106S, POSC 110 or POSC 110S, POSC 111, POSC 112, POSC 113, POSC 115, POSC 116, POSC 117, POSC 119, POSC 122
- b) Five additional courses in Political Science course work (Not more than 2 courses from the 190 series and POSC 142L and

POSC 142M are allowed toward the nine-course upper-division requirement.)

A course in statistics is strongly recommended.

### Political Science/Administrative Studies Major

The major requirements for the B.A. degree in Political Science/Administrative Studies are as follows. Note that the prerequisite for POSC 198-I is a GPA of 2.70 or better.

#### Political Science requirements (48 units)

1. Lower-division requirements
 

Three courses from POSC 005 or POSC 005H or POSC 005W or POSC 007; POSC 010 or POSC 010H; POSC 015 or POSC 015H or POSC 017; POSC 020 or POSC 020H

Students in the major must complete two of the three lower-division Political Science courses with a grade of "C" or better in order to take upper-division political science courses.
2. Upper-division requirements
  - a) Three courses from POSC 181, POSC 182, POSC 183, POSC 186
  - b) At least one course from each of the following:
    - (1) U.S. Government and Politics: POSC 100, POSC 101, POSC 108, POSC 143, POSC 144 or POSC 144S, POSC 145, POSC 146, POSC 148 or POSC 148H or POSC 148S, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 172/URST 172, POSC 173 or POSC 173S, POSC 180 or POSC 180S, POSC 181, POSC 182, POSC 183, POSC 184 or POSC 184S, POSC 186
    - (2) Comparative Government and Politics: POSC 120, POSC 131, POSC 133, POSC 151, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 161/LNST188, POSC 162/LNST 142, POSC 163, POSC 164 or POSC 164S
    - (3) International Relations and Foreign Policy: POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126, POSC 127, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 135, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 153, POSC 169
    - (4) Political Theory: POSC 106 or POSC 106S, POSC 110 or POSC 110S, POSC 111, POSC 112, POSC 113, POSC 115, POSC 116, POSC 117, POSC 119, POSC 122
  - c) Four (4) units from POSC 198G or POSC 198-I (prerequisite: GPA of 2.70 or better)

d) Additional four (4) units in any upper-division Political Science course

#### Administrative Studies requirements (37 units)

1. Lower-division courses (17 units)
  - a) BUS 010, BUS 020
  - b) STAT 048 or equivalent (may be used to satisfy breadth requirements)
  - c) CS 008 (may be used to satisfy breadth requirements)
2. Upper-division requirements (20 units)
  - a) Two courses (8 units) from the list below:
    - (1) ECON 102 or ECON 104A or ECON 130 or ECON 162/BUS 162
    - (2) PSYC 140 or PSYC 142
    - (3) SOC 150 or SOC 151 or SOC 171
    - (4) POSC 181 or POSC 182 or POSC 183
    - (5) ANTH 127 or ANTH 131

These two courses must be outside the discipline of Political Science and cannot be courses included as part of the three course Business Administration track or their cross-listed equivalents.
  - b) A three-course track (12 units) in Business Administration courses from one of the following:
    - (1) Organizations (General): BUS 100, BUS 107, 176/SOC 176, BUS 158/ANTH 105, SOC 150, SOC 151
    - (2) Human Resources Management/Labor Relations: BUS 100, BUS 107, BUS 152/ECON 152, BUS 153/ECON 153, BUS 155, BUS 157, PSYC 142
    - (3) Business and Society: BUS 100, BUS 102, BUS 107, PHIL 116, POSC 182, POSC 186
    - (4) Marketing: BUS 103, and two from BUS 112, BUS 113, BUS 114, BUS 117
    - (5) Managerial Accounting/Taxation: BUS 108, and two from BUS 166, BUS 168A, BUS 168B
    - (6) Financial Accounting: BUS 108, BUS 165A, BUS 165B
    - (7) Finance: BUS 106/ECON 134 and two from BUS 134, BUS 136, BUS 137, BUS 138, BUS 139
    - (8) Management Information Systems: BUS 101, BUS 171, BUS 173
    - (9) Production Management: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

**Note** in filling the dual requirements of the selected major, students may not count more than two courses toward both parts of their total requirements (Political Science requirements and Administrative Studies requirements).

## Political Science/International Affairs Major

The major requirements for the B.A. degree in Political Science/International Affairs are as follows:

1. Lower-division requirements (two courses [at least 10 units]): One course from a and one course from b:

- a) POSC 015 or POSC 015H or POSC 017
- b) POSC 020 or POSC 020H.

Students in the major must complete two lower-division Political Science courses with a grade of "C" or better in order to take upper-division political science courses.

Upper-division requirements (16 courses [at least 64 units]):

- a) International Relations (four courses)  
POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126, POSC 127, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 134 or POSC 134S, POSC 135, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 169
- b) Comparative Politics (four courses)  
POSC 120, POSC 131, POSC 133, POSC 151, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 161/LNST188, POSC 162/LNST 142, POSC 164 or POSC 164S, POSC 178
- c) General Political Science (four other political science courses in any subfield).
- d) In addition, students must take four courses from the following:  
ANTH 161/LNST 161, ANTH 163, ANTH 164/LNST 164/WMST 164, ANTH 186/LNST 166  
  
ECON 171, ECON 175, ECON 178/  
BUS 178, ECON 181, ECON 182, ECON 185/LNST 185  
  
HISA 117B, HISA 164B, HISE 141, HISE 142, HISE 145, HISE 146, HISE 174, HIST 182  
  
SOC 135, SOC 137, SOC 161

Students may petition for permission to count a specific course not on this list.

Political Science/International Affairs majors are strongly encouraged to learn a language other than English. The university offers language instruction in Chinese, French, German, Greek, Italian, Japanese, Korean, Latin, Portuguese, Spanish, and Vietnamese.

## Political Science/Law and Society Major

The major requirements for the B.A. degree in Political Science/Law and Society are as follows:

1. **Political Science requirements** (52 units)  
All major requirements for the B.A. in Political Science

2. **Law and Society requirements** (36 units)

- a) PHIL 007 or PHIL 007H
- b) LWSO 100
- c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
- d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
- e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
- f) LWSO 193, Senior Seminar

**Note** For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department in filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Political Science requirements and Law and Society requirements).

## Political Science/Public Service Major

The major requirements for the B.A. degree in Political Science/Public Service are as follows. Note that the prerequisite for POSC 198-I is a GPA of 2.70 or better.

1. Lower-division requirements (five courses [at least 20 units])
  - a) POSC 010 or POSC 010H
  - b) One course from POSC 005 or POSC 005H or POSC 005W, POSC 007, POSC 015 or POSC 015H or POSC 017, POSC 020 or POSC 020H
  - c) ECON 003
  - d) SOC 004
  - e) SOC 005 or STAT 040

Students in the major must complete two of the lower-division Political Science courses with a grade of "C" or better in order to take upper-division political science courses.

2. Upper-division requirements (11 courses [at least 44 units])
  - a) Political Science distribution: choose one course from each group
    - (1) Comparative Government and Politics Group: POSC 120, POSC 131, POSC 133 POSC 151, POSC 152, POSC153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157, POSC 158/LNST148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 161/LNST188, POSC 162/LNST 142, POSC 163, POSC 164 or POSC 164S, POSC 178
    - (2) International Relations and Foreign Policy Group: POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126, POSC 127, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 133, POSC 135, POSC 147 or

POSC 147S, POSC 150 or POSC 150S, POSC 169

- (3) Political Theory Group: POSC 106 or POSC 106S, POSC 110 or POSC 110S, POSC 111, POSC 112, POSC 113, POSC 115, POSC 116, POSC 117, POSC 119, POSC 122
- b) Public Service requirement
  - (1) POSC 181, POSC 183
  - (2) Eight (8) units from POSC 198G and POSC 198-I (prerequisite: GPA of 2.70 or better)
  - (3) An additional four courses from POSC 118, POSC 170, POSC 171, POSC 172/URST 172, POSC 182, POSC 186

## Minor

The Political Science Department offers a minor in Political Science.

1. One lower-division course (at least 5 units) in political science, selected from POSC 005 or POSC 005H or POSC 005W or POSC 007; POSC 010 or POSC010H; POSC 015 or POSC 015H or POSC 017; POSC 020 or POSC 020H
2. Five upper-division courses (at least 20 units) to be selected as follows:
  - a) One course in each of the following areas (4 courses):
    - (1) American Politics: POSC 100, POSC 101, POSC 108, POSC 143, POSC 144 or POSC 144S, POSC 145, POSC 146, POSC 148 or POSC 148H or POSC 148S, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 172/URST 172, POSC 173 or POSC 173S, POSC 180 or POSC 180S, POSC 181, POSC 182, POSC 183, POSC 184 or POSC 184S, POSC 186
    - (2) Comparative Politics: POSC 120, POSC 131, POSC 133, POSC 151, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 162/LNST 142, POSC 163 or POSC 163S, POSC 164 or POSC164S, POSC 178 or POSC 178S
    - (3) International Relations: POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126, POSC 127, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 134 or POSC 134S, POSC 135, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 169
    - (4) Political Theory: POSC 106 or POSC 106S, POSC 110 or POSC 110S, POSC 111, POSC 112, POSC 113, POSC 115, POSC 116, POSC 117, POSC 119, POSC 122

- b) One additional course selected by the student from among those listed in (1) through (4) above.

The Political Science Department also offers a minor in **International Relations** (listed elsewhere in this catalog). Also, see Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Honors Program

The Political Science undergraduate Honors Program is designed to provide qualified upper-division Political Science majors with opportunities to engage in upper-division course work in the field in an intensive seminar format and to obtain the necessary training to engage in independent research in the field.

Upon successful completion of the program, students are awarded and have posted on their transcripts, the designation Honors, Department of Political Science Undergraduate Honors Program.

Complete details and an application are available from the Political Science Student Affairs Officer.

### Prerequisites for the Honors Program

1. Submission of an application during the last quarter of the sophomore or junior year
2. Junior standing (completion of a minimum of 86 units)
3. Minimum GPA requirements or consent of director
  - a) Cumulative GPA of 3.50
  - b) A GPA of 3.50 in upper-division major courses
4. Statistics or methods course required. One course chosen from ECON 111, POSC 114 or POSC 114S, PSYC 012, SOC 004 (or an equivalent course in research methods)

### Requirements for the Honors Program

Twelve (12) units/three courses from the following:

- POSC 175H (Introduction to the Honors Thesis)
- POSC 176H (Seminar on Writing the Honors Thesis)
- POSC 177H (Honors Thesis)
- POSC 199 (Senior Research[Thesis Optional])

## Model United Nations (MUN)

The Model United Nations (MUN) program is a campuswide activity that combines academic and social aspects. The academic preparation takes place within the Political Science Department, with one course, POSC 142L. The simulation preparation takes place within the UCR-MUN organization, for participation in external conferences. Each year, the UCRMUN organization hosts a two-day MUN conference, which attracts over a thousand high school students. In recent years, the UCRMUN High School MUN

has been the third largest in the nation. Planning and running this conference is entirely in the hands of UCR students participating in the UCRMUN program. The program provides training in administration and diplomacy. In the spring, a UCRMUN delegation attends either a local conference or the National Model United Nations Conference in New York City.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education

Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

The Department of Political Science offers the M.A. and Ph.D. degrees in Political Science.

**Admission** Admission to both the M.A. and Ph.D. degrees is based on the quality and character of previous academic work, scores on the GRE, and letters of evaluation from previous instructors. Applications are accepted for the Fall quarter only.

## Master's Degree

The Department of Political Science offers the M.A. degree in Political Science.

Usually, the department operates under Plan II.

**Plan II (Comprehensive Examination)** Students must complete 36 units, of which at least 32 units must be in 200-level Political Science courses, including POSC 201, POSC 202A, and POSC 203. In addition, students must complete at least one course from at least three of the five fields offered by the department (see listing below). Up to 4 units of academic work in related fields may be approved by the graduate advisor as part of the 36 units.

The examination must be passed in one of the following fields:

1. **Comparative Politics** Students must complete the core course POSC 217 and at least one additional course in the field.
2. **International Relations** Students must complete the core course POSC 216 and at least one additional course in the field.
3. **American Politics** Students must complete the core course POSC 249 and at least one additional course in the field.

4. **Mass Political Behavior** Students must complete a core course, either POSC 255 or POSC 256, and at least one additional course in the field.

5. **Political Theory** Students must complete the core course POSC 212 and at least one additional course in the field.

Permission to complete the M.A. program under Plan I (Thesis) is restricted to students who can demonstrate a readiness to undertake advanced independent research and who can identify a faculty member willing to supervise preparation of the thesis.

## Doctoral Degree

The Department of Political Science offers the Ph.D. degree in Political Science.

The first two years of the program are devoted to course work and preparation for the Ph.D. examination. During this period, students obtain substantive background in the discipline through completion of three graduate courses per quarter. Course work, which will usually continue beyond the second year, includes the following required components:

1. Selecting two major fields of concentration from the five fields listed below.
2. Satisfying course requirements for the major fields, which requires a total of eight graduate courses. (This is the **Major Field Requirement**; see details below.)
3. Taking one course in each of the three fields of study not selected by the student as a major field. (This is the **Distribution Requirement**.)
4. Taking three additional graduate courses in any field of study, according to the student's choice, in consultation with the faculty advisors. With permission of the Graduate Advisor, one or more of these courses may be graduate-level courses outside of Political Science. (This is the **Depth Requirement**.)
5. Completing four required methods courses: POSC 201, POSC 202A, POSC 202B, and POSC 203. (This is the **Methods Requirement**.)
6. Enrollment each quarter in POSC 230. Students must be enrolled in the course while in residence, until completion of 15 units. Exceptions only by permission of Graduate Advisor. (This is the **Research Colloquium Requirement**.)

The major fields may be chosen from among American Politics, Mass Political Behavior, Comparative Politics, International Relations, and Political Theory.

1. **Comparative Politics** Students must complete the core course POSC 217 and at least three additional courses in the field.
2. **International Relations** Students must complete the core course POSC 216 and at least three additional courses in the field.

3. **American Politics** Students must complete the core course POSC 249 and at least three additional courses in the field.
4. **Mass Political Behavior** Students must complete a core course, either POSC 255 or POSC 256, and at least three additional courses in the field.
5. **Political Theory** Students must complete the core course POSC 212 and at least three additional courses in the field.

One POSC 290 course may be accepted in lieu of a seminar. This limit may be exceeded by permission of Graduate Advisor if course staffing or scheduling problems require it. All POSC 290 courses must have prior approval of the graduate advisor. A POSC 290 course should only be taken if the material to be covered is not available in a scheduled course.

**Written Qualifying Examination** Students should ordinarily complete major field course requirements during Years One and Two. In the fall quarter of Year Three, the student continues to enroll in POSC 230, while also enrolling in POSC 291 (Individual Coordinated Study), which is designed to aid preparation for the comprehensive examination. Written examinations in the two major fields are normally taken at the end of the fall quarter of the third year. Postponements to this schedule are allowed in exceptional circumstances; all delays in taking comprehensive examinations must be approved by the Graduate Committee.

**Oral Defense of Prospectus** The winter and spring quarters of Year Three are devoted to Directed Research (POSC 297) to prepare a dissertation prospectus under the direction of the principal advisor; to additional substantive seminars; and to continued participation in POSC 230. The choice of substantive seminars during this time should be made in conjunction with faculty advisors and should usually be applicable either to the distribution or depth requirements, although students may also take courses in excess of these requirements. In the spring quarter, students are advanced to candidacy upon successful completion of the oral defense of their dissertation prospectus.

Normative time to completion of the program is five years. Additional time is provided if circumstances warrant it. Whether circumstances justify additional time is to be determined by the Graduate Committee, in cooperation with the thesis advisor.

Students who do not complete their degree requirements during this two-year period are closely reviewed on a biannual basis. These reviews are provided by the graduate advisor, after consultation with the dissertation advisor. Until completion of the Ph.D. requirements, each review includes targeted amounts of required progress, to be completed prior to the next review. Students who fail to complete their scheduled work are reviewed by the Graduate Program Committee for a recommendation of termination from the Political Science graduate program.

**Normative Time to Degree** 15 quarters.

General regulations applying to the dissertation and qualifying examinations are found in the Graduate Studies section of this catalog and in other Graduate Division and department publications.

For further information, contact the graduate advisor, Department of Political Science.

## Lower-Division Courses

**POSC 005. Political Ideologies (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. An introductory study of the ideologies of the modern era. Explores selected thinkers and texts representative of liberalism, conservatism, socialism, fascism, nationalism, nonviolence, and feminism, as well as various non-Western ideologies. Credit is awarded for only one of POSC 005, POSC 005H, or POSC 005W.

**POSC 005H. Honors Political Ideologies (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to POSC 005 and POSC 005W. An introductory study of the ideologies of the modern era. Explores selected thinkers and texts representative of liberalism, conservatism, socialism, fascism, nationalism, nonviolence, and feminism, as well as various non-Western ideologies. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 005, POSC 005H, or POSC 005W.

**POSC 005W. Political Ideologies (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): a grade of "C" or better in ENGL 001B or consent of instructor. An introductory study of the ideologies of the modern era. Explores selected thinkers and texts representative of liberalism, conservatism, socialism, fascism, nationalism, nonviolence, and feminism, as well as various non-Western ideologies. This course fulfills the third quarter writing requirement for students who earn a grade of "C" or better. Credit is awarded for only one of POSC 005, POSC 005H, or POSC 005W.

**POSC 007. Introduction to Political Theory (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. An introductory exploration of political theory from the ancient world to the present. Covers either Western theorists (from Aristotle to Rawls) or non-Western theorists (from Confucius to Gandhi). Topics include citizenship, community, political change, and human flourishing.

**POSC 010. American Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. An introduction to the principles and practices of government, with special attention to the policy process and selected political issues in the United States. Credit is awarded for only one of POSC 010 or POSC 010H.

**POSC 010H. Honors American Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to POSC 010. An introduction to the principles and practices of government, with special attention to the policy process and selected political issues in the United States. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 010 or POSC 010H.

**POSC 015. Comparative Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. A comparative analysis of contemporary political systems, prac-

tices, and institutions. Credit is awarded for only one of POSC 015 or POSC 015H.

**POSC 015H. Honors Comparative Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to POSC 015. A comparative analysis of contemporary political systems, practices, and institutions. Credit is awarded for only one of POSC 015 or POSC 015H.

**POSC 017. Politics of the Underdeveloped World (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. An introduction to the political processes and problems confronting third-world states. Topics include poverty, violence, dictatorship, civil-military relations, regime transitions, and democracy.

**POSC 020. World Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Explores approaches to and models of international relations: theories, the causes of war, international organizations, cooperation and conflict, international political economy, regional economic agreements, and international social issues such as human rights and the environment. Credit is awarded for only one of POSC 020 or POSC 020H.

**POSC 020H. Honors World Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to POSC 020. Explores approaches to and models of international relations: theories, the causes of war, international organizations, cooperation and conflict, international political economy, regional economic agreements, and international social issues such as human rights and the environment. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 020 or POSC 020H.

**POSC 045. Special Seminar in Political Science (1)** Intensive examination of specific political arenas, utilizing the expertise of prominent political practitioners. Will be offered not more than once a quarter; can be repeated up to four times for credit.

## Upper-Division Courses

**POSC 100. Presidential Politics (4)** Lecture, 3 hours; outside research, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analyzes modern presidential leadership and power. Topics include the institutional presidency, presidential selection, and the presidency's relationships with the bureaucracy, Congress, interest groups, the press, and the public. Considers what makes presidents popular and what determines the effectiveness of presidential leadership.

**POSC 101. The U.S. Congress (4)** Lecture, 3 hours; outside research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the politics of the contemporary U.S. Congress, with an emphasis on the historical roots of the institution. Topics include representation, elections, parties and leaders, committees, public policy, and the relationships between Congress and the other branches of government.

**POSC 106. Environmental Political Thought (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Addresses various philosophical aspects of the human relationship to the environment from social, political, and economic perspectives.

Includes debates related to issues such as how should human beings interact with their environment, as well as the relationship of environmental practice to liberalism, democracy, and capitalism. Credit is awarded for only one of POSC 106 or POSC 106S.

**POSC 106S. Environmental Political Thought (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Addresses various philosophical aspects of the human relationship to the environment from social, political, and economic perspectives. Includes debates related to issues such as how should human beings interact with their environment, as well as the relationship of environmental practice to liberalism, democracy, and capitalism. Credit is awarded for only one of POSC 106 or POSC 160S.

**POSC 107. Non-Western Political Thought (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. Exposes students to some of the key political thinkers and ideas outside the Western canon. Familiarizes students with both the cultural-religious legacies and the political thought endemic to non-Western societies. Follows an overview of key non-Western civilizations and addresses crucial problems in comparative political theory. Provides a more detailed analysis of some regions - from the political thought of Islam to the traditions of India to the Far Eastern political theory.

**POSC 108. Politics of Race, Immigration, and Ethnicity in the United States (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor; POSC 010 or POSC 010H. Examines the politics of race, immigration, and ethnicity in the United States, including comparisons between African Americans and Latino, Asian, and European immigrants. Emphasizes the role of institutions in shaping the importance of race to politics in the United States.

**POSC 109. Political Religions and Religious Politics (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigation of major themes and issues in the intersection of religion and politics, such as the sacralization of politics, religious nationalisms, sacral kingship, revolutionary asceticism, "throne and altar," civil religion, millennialism, political myth and ritual, integralism, and the conformity of the polity to religious values. Cross-listed with RLST 173.

**POSC 110. The Origins of Political Ideas (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the major schools of political thought of ancient times. Covers political philosophers such as Plato, Aristotle, Confucius, and Ashoka. Credit is awarded for only one of POSC 110 or POSC 110S.

**POSC 110S. The Origins of Political Ideas (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the major schools of political thought of ancient times. Covers political philosophers such as Plato, Aristotle, Confucius, and Ashoka. Credit is awarded for only one of POSC 110 or POSC 110S.

**POSC 111. Democracy and the Social Contract (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the major political philosophers of the social contract and their critics on issues such as individualism versus community, the roles of religion and of markets in politics, and the adequacy of contract theory for women and minorities.

**POSC 112. Modern Political Theory (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critically explores selected works of political theory from the eighteenth century to the present, with attention to issues such as freedom, utility, justice, nature, citizenship, toleration, equality and inequality, autonomy, democracy, power, rights, and identity.

**POSC 113. American Political Thought (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of developments in American political thought from the seventeenth century to the present.

**POSC 114. Theory and Methodology of Political Science (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers the development and scope of political science as a discipline. Addresses selected theoretical and methodological issues in contemporary political and social science. Credit is awarded for only one of POSC 114, POSC 114H, or POSC 114S.

**POSC 114H. Honors Theory and Methodology of Political Science (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing, admission to the University Honors Program; or consent of instructor. Honors course corresponding to POSC 114 and POSC 114S. Covers the development and scope of political science as a discipline. Addresses selected theoretical and methodological issues in contemporary political and social science. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 114, POSC 114H, or POSC 114S.

**POSC 114S. Theory and Methodology of Political Science (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers the development and scope of political science as a discipline. Addresses selected theoretical and methodological issues in contemporary political and social science. Credit is awarded for only one of POSC 114, POSC 114H, or POSC 114S.

**POSC 115. Utopia and Dystopia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. Examines the political theory of utopian literature from ancient Greece to the present, with analysis of utopian and dystopian elements in each work. Typical authors include Plato, Thomas More, James Harrington, Ernest Callenbach, and Katherine Forrest.

**POSC 116. Capitalism, Socialism, and Political Theory (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines debates about economic life, focusing on issues such as markets and marketization, labor, globalization, freedom, class, corporations, democracy, the welfare state, and power.

**POSC 117. Contemporary Democratic Theory (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical survey of the principal approaches to thinking about democracy since the World War II. May cover elite, pluralist, deliberative and participatory theories may be explored, along with questions about inclusiveness, and the optimal character and scope of democracy.

**POSC 118. Ethics in Government (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or POSC 010 or POSC 010H or consent of instructor. An examination of ethical issues in government, with emphasis on problems of representation in elected and administrative office, questions of political responsibility, and controversies regarding the

role and nature of the public interest in government policy making.

**POSC 119. Political Thinkers in Depth (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing. Intensive reading of one or more great political thinkers from around the world, with special attention to contested readings of each figure. Examples might include Plato, Confucius, Machiavelli, Marx and Engels, John Stuart Mill, or Gandhi.

**POSC 120. The Politics of India and Pakistan (4)** Lecture, 3 hours; extra reading and term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the domestic and international politics of India and Pakistan, with attention to other South Asian countries. Explores nationalist movements, struggles for development, contrasting experiences with democracy and dictatorship, and internal and external conflicts.

**POSC 121. Monarchy (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious life. Cross-listed with CLA 121 and CPAC 121.

**POSC 122. Skepticism and Liberalism (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; one term paper. Prerequisite(s): upper-division standing. Explores the origins of the modern way of thinking about politics (i.e., liberalism, in a sense that includes both conservatives and liberals) in the ancient skeptics and in early modern skeptics such as Montaigne, Spinoza, Hume, and Kant.

**POSC 123. Conflict Resolution (4)** Lecture, 3 hours; extra reading, 1 hour; term paper, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of conflict resolution in international relations and domestic conflict. Topics covered include theories of conflict and conflict resolution, negotiation, the role of external powers, mediation, and peacekeeping.

**POSC 124. International Relations (4)** Lecture, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): POSC 020. An in-depth consideration of the major theories of contemporary international relations. Focuses on core issues in international security affairs, such as the causes of war and peace, cooperation and conflict, alliances, perception and misperception, ethnic conflict, and the link between democracy and war. Credit is awarded for only one of POSC 124 or POSC 124S.

**POSC 124S. International Relations (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): POSC 020; upper-division standing or consent of instructor. An in-depth consideration of the major theories of contemporary international relations. Focuses on core issues in international security affairs, such as the causes of war and peace, cooperation and conflict, alliances, perception and misperception, ethnic conflict, and the link between democracy and war. Credit is awarded for only one of POSC 124 or POSC 124S.

**POSC 125. United States Foreign Policy Since World War II (4)** Lecture, 3 hours; outside research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A survey and evaluation of the major developments in U.S. foreign policy from 1945 to the present. Focuses on relations with the Soviet Union, its successor states, and the Third World, within which the uses of force and diplomacy are emphasized.

**POSC 126. The Politics of International Trade, Finance, and Development (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): POSC 020 or POSC

O20H. A study of the interaction between international economics and world politics. Focuses on the post-World War II period and covers the evolution of the institutions governing world trade; the role of multinational corporations; Third World debt and development; the North Atlantic Treaty Organization and the European Union; economic reform in postcommunist societies; and the relationship between trade and the environment.

**POSC 127. International Environmental Politics (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): POSC O20 or POSC O20H. Introduces the study and practice of international environmental politics. Familiarizes students with major developments in the evolution of international environmental law and policy. Topics covered include ozone depletion, acid rain, marine pollution and whaling, tropical deforestation, overpopulation, and the impact of environmental degradation on the politics of sub-Saharan Africa.

**POSC 128. Comparative Foreign Policy (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; one term paper. Prerequisite(s): upper-division standing. Compares foreign policies of the United States and the Soviet Union with special attention to the influence of historical, political, ideological, and systemic factors on their international behavior. Close attention paid to their use of military and economic instruments in their relationship with various actors.

**POSC 129. The Proliferation of Weapons of Mass Destruction (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing. Introduces students to the politics of weapons of mass destruction, including nuclear, chemical, and biological weapons. Topics covered include why states develop such weapons and whether possession of them increases or decreases the likelihood of war. Also covered are international efforts to stop weapons proliferation, and specific cases of proliferation such as those in India, and Pakistan, North Korea, Iraq, and Iran.

**POSC 130. Politics and Economics of the Pacific Rim (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides students with a broad understanding of the politics and economics of countries that border the Pacific Rim, including Japan, South Korea, Singapore, Taiwan, and China, and of their relationship to the United States. The major issues addressed include economic growth, sociopolitical development, trade, and interdependence.

**POSC 131. Modern Japanese Politics (4)** Lecture, 3 hours; writing and extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the politics of postwar Japan. Topics include Who rules contemporary Japan? How do we explain long-term conservative rule and economic success? and What are the sources of recent political instability and economic hard times and is the situation likely to continue?

**POSC 132. Postconflict Justice and Reconciliation (4)** Lecture, 3 hours; term paper, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing. Examines a range of strategies for pursuing justice and reconciliation in the aftermath of war and other forms of violent conflict. Topics include the laws of war theory, international criminal justice, truth commissions, and restorative justice. Credit is awarded for only one of POSC 132 or POSC 132S.

**POSC 132S. Postconflict Justice and Reconciliation (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing. Examines a range of strategies for

pursuing justice and reconciliation in the aftermath of war and other forms of violent conflict. Topics include the laws of war, just war theory, international criminal justice, truth commissions, and restorative justice. Credit is awarded for only one of POSC 132 or POSC 132S.

**POSC 133. Politics of Central Asia in Comparative Perspective (4)** Lecture, 3 hours; extra reading, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Studies the current political and economic issues and problems, and international relations of the former Soviet republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Includes a historical background of the region.

**POSC 134. Political Economy of International Finance (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines historical and contemporary issues in international money finance. Explores how financial globalization shaped policy decisions at the national and the international level. Utilizes examples from developed and developing countries with different political and legal regimes. Credit is awarded for only one of POSC 134 or POSC 134S.

**POSC 134S. Political Economy of International Finance (5)** Lecture, 3 hours; discussion, 1 hour; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines historical and contemporary issues in international money finance. Explores how financial globalization shaped policy decisions at the national and the international level. Utilizes examples from developed and developing countries with different political and legal regimes. Credit is awarded for only one of POSC 134 or POSC 134S.

**POSC 135. Ethics and International Politics (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the ethical dimensions of contemporary debates in international politics. Topics include international justice, humanitarian aid, military intervention, and just war theory. Credit is awarded for only one of POSC 135 or POSC 267.

**POSC 140. Militarism and Hegemony in the Ancient World (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with AST 145, CHN 141, CLA 141, and CPAC 141.

**POSC 142 (E-Z). Simulation Laboratory (2-4)** Participation in and analysis of laboratory models of complex political systems.

**POSC 142L. The United Nations (2)** Lecture, 2 hours. Examination of the structure and functioning of the United Nations with major emphasis on the principal organs (Security Council, General Assembly), ECOSOC, the Trusteeship Council and the leading committees. The course will examine theories on the pacific settlement of disputes, collective security and functionalism. The focus will be on the United Nations as a living, contemporary political institution.

**POSC 142M. Model U.N.-Country Studies (Simulation) (2)** simulation, 2 hours. Prerequisite(s): POSC 142L. An intensive study of the foreign policy of two selected countries, normally one developed and

one undeveloped country, conducted through lectures, discussion, and simulations of their foreign policies being projected in the arena of the United Nations. Can be repeated twice for a total of 6 units.

**POSC 143. Elections and Political Participation (4)** Lecture, 3 hours; consultation, 1 hour. An examination of political behavior in the United States with emphasis on political participation and voting behavior.

**POSC 144. Politics through Film (4)** Lecture, 3 hours; screening, .5 hours; extra reading, 1 hour; term paper, 1.5 hours. Prerequisite(s): upper-division standing. Uses film to explore how the values of democracy inform the operation of government. Topics include collective action, principal-agent problems, equality, liberty, popular sovereignty, and strategic behavior. Credit is awarded for only one of POSC 144 or POSC 144S.

**POSC 144S. Politics through Film (5)** Lecture, 3 hours; discussion, 1 hour; screening, .5 hours; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing. Uses film to explore how the values of democracy influence the operation of government. Topics include collective action, principal-agent problems, equality, liberty, popular sovereignty, and strategic behavior. Credit is awarded for only one of POSC 144 or POSC 144S.

**POSC 145. Money in American Politics (4)** Lecture, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): POSC O10 or POSC O10H or consent of instructor. Analyzes the role of money in federal elections and in the formulation of public policy. Examines the contemporary role of parties in raising and spending campaign money, the explosion of "soft money" in congressional and presidential elections, and the effect of campaign spending on electoral outcomes. Explores how campaign contributions influence public policy.

**POSC 146. Mass Media and Public Opinion (4)** Lecture, 3 hours; term paper and reading, 1 hour. Analysis of public opinion—character, sources, and functions—and especially its relationship to mass media. Particular attention will be devoted to the role and importance of television in American politics.

**POSC 147. Political Theory of Globalization (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing; PHIL 001 or PHIL 001H or POSC 005 or POSC 005H or POSC 005W. Examines how the phenomenon of globalization has been theorized within the discipline of political philosophy. Covers how the effects of globalization have been addressed by leading political theorists. Focuses on concepts such as cosmopolitanism, nation-states and citizenship, cultural diversity, moral universalism, and international distributive justice. Credit is awarded for only one of POSC 147 or POSC 147S.

**POSC 147S. Political Theory of Globalization (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing; PHIL 001 or PHIL 001H or POSC 005 or POSC 005H or POSC 005W. Examines how the phenomenon of globalization has been theorized within the discipline of political philosophy. Covers how the effects of globalization have been addressed by leading political theorists. Focuses on concepts such as cosmopolitanism, nation-states and citizenship, cultural diversity, moral universalism, and international distributive justice. Credit is awarded for only one of POSC 147 or POSC 147S.

**POSC 148. Politics of Congressional Elections (4)** Lecture, 3 hours; term paper, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing, POSC O10 or POSC O10H; or consent of instructor. An

introduction to the politics of congressional elections. Topics include campaigning for Congress, strategic behavior in the decision to run for election, incumbency, and money in congressional elections. Credit is awarded for only one of POSC 148, POSC 148H, or POSC 148S.

**POSC 148H. Honors Politics of Congressional Elections (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): admission to the University Honors Program, upper-division standing, POSC 010 or POSC 010H; or consent of instructor. Honors course corresponding to POSC 148 and POSC 148S. An introduction to the politics of Congressional elections. Topics include campaigning for congress, strategic behavior in the decision to run for election, incumbency, and money in congressional elections. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 148, POSC 148H, or POSC 148S.

**POSC 148S. Politics of Congressional Elections (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing, POSC 010 or POSC 010H; or consent of instructor. An introduction to the politics of congressional elections. Topics include campaigning for Congress, strategic behavior in the decision to run for election, incumbency, and money in congressional elections. Credit is awarded for only one of POSC 148, POSC 148H, or POSC 148S.

**POSC 149. Presidential Elections (4)** Lecture, 3 hours; laboratory, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing. Investigation of presidential elections using computer simulation of presidential popularity, public opinion polling, presidential primaries, and the presidential general election. In addition, students use National Election Study data to explore individual-level voter decision making.

**POSC 150. Human Rights in Theory, Law, and Politics (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the theory, politics, and law of human rights. Examines the emergence of human rights institutions since World War II and ongoing dilemmas in the field. Topics include cultural relativism, criminal tribunals, truth commissions, and refugees. Credit is awarded for only one of POSC 150 or POSC 150S.

**POSC 150S. Human Rights in Theory, Law, and Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the theory, politics, and law of human rights. Examines the emergence of human rights institutions since World War II and ongoing dilemmas in the field. Topics include cultural relativism, criminal tribunals, truth commissions, and refugees. Credit is awarded for only one of POSC 150 or POSC 150S.

**POSC 151. British Government and Politics (4)** Lecture, 3 hours. A study of constitutional principles and of contemporary government and politics, primarily in the United Kingdom but with some attention to overseas diffusion of the Westminster model of government.

**POSC 152. Politics of the Middle East (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The domestic policies and international relations of the contemporary states of the Middle East. Includes analysis of the poli-

tics of various transnational forces and the policies of external powers as they impinge on the area.

**POSC 153. Russian Foreign Policy in Transition (4)** Lecture, 3 hours; extra reading and term paper, 3 hours. Prerequisite(s): POSC 020 or POSC 020H; upper-division standing or consent of instructor. Surveys postwar Russian foreign policy with an emphasis on recent changes in relations between the United States and Eastern Europe and the independent states that formerly comprised the USSR. Utilizes various international relations theories and concepts to help students understand these significant changes.

**POSC 154. The Government and Politics of the European Community (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the formation of the European Community, its institutional structure, its policy-making processes, and its new role in Europe. Explores its success in the face of Western Europe's persistent nationalism.

**POSC 155. Government and Politics in Western Europe (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of government and politics in Western Europe and how economic and cultural factors influence their formation. Analyzes how parties, bureaucracy, legislatures, and executives influence the political life of Western Europe. Focuses on the governing bodies in Britain, France, and Germany. Credit is awarded for only one of POSC 155 or POSC 155S.

**POSC 155S. Government and Politics in Western Europe (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of government and politics in Western Europe and how economic and cultural factors influence their formation. Analyzes how parties, bureaucracy, legislatures, and executives influence the political life of Western Europe. Focuses on the governing bodies in Britain, France, and Germany. Credit is awarded for only one of POSC 155 or POSC 155S.

**POSC 156. Political Systems across Muslim Societies (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A survey of the different political systems and institutional arrangements regulating the relationship between religion and the state across the Muslim world. Includes the history and main tenets of Islam and case studies such as Iran, Indonesia, Jordan, Pakistan, Nigeria, and the United States.

**POSC 157. Modern Dictatorships (4)** Lecture, 3 hours; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Considers how dictatorships from such countries as Germany, Cambodia, Chile, Argentina, and Iraq came to power; how they abused that power; what contributed to their successes; and why some met with defeat.

**POSC 158. Politics of Mexico (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A survey of contemporary Mexican politics. Emphasis is on recent economic and social changes and their impact on Mexico's political system. Topics include relations with the United States, the rise of drug trafficking in Mexico, and the recent emergence of opposition politics. Cross-listed with LNST 148.

**POSC 159. The Armed Forces and Politics (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s):

upper-division standing or consent of instructor. An introduction to the origins, nature, and behavior of the military within political systems. Focuses on the political interaction between the armed forces and civilians. Topics include military intervention, democracy, human rights, missions, defense organizations, and civilian control. Explores case studies of the United States, Russia, and countries from Latin America and Asia. Credit is awarded for only one of POSC 159 or POSC 159S.

**POSC 159S. The Armed Forces and Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the origins, nature, and behavior of the military within political systems. Focuses on the interaction between the armed forces and civilians, as well as the origins of military subordination and insubordination. Topics include military intervention, civilian control strategies, military missions, defense organization, civil-military relations in peace and wartime, and human rights. Covers case studies from Latin America, the United States, Russia, and Eastern Europe. Credit is awarded for only one of POSC 159 or POSC 159S.

**POSC 160. Globalization and Underdevelopment (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the political causes and consequences of the spread of the modern state, the competitive market, and political democracy. Examines how these political institutions interact with one another and shape the possibility of development. Credit is awarded for only one of POSC 160 or POSC 160S.

**POSC 160S. Globalization and Underdevelopment (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the political causes and consequences of the spread of the modern state, the competitive market, and political democracy. Examines how these political institutions interact with one another and shape the possibility of development. Credit is awarded for only one of POSC 160 or POSC 160S.

**POSC 161. U.S.-Latin American Relations (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores international relations between the United States and the nations of Latin America. Examines different theories for explaining changes in the conduct of U.S.-Latin American relations over time. Topics include democracy and empire, revolution and counter-insurgency, economic integration and trade, petroleum politics, drug trafficking, and migration flows. Cross-listed with LNST 188.

**POSC 162. Latin America: The Quest for Development and Democracy (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A comparative examination of central issues in and components of Latin American political life. Covers economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Includes Argentina, Chile, Venezuela, and Peru. Cross-listed with LNST 142. Credit is awarded for only one of LNST 142/POSC 162 or LNST 142S/POSC 162S.

**POSC 162S. Latin America: The Quest for Development and Democracy (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A comparative examination of central

issues in and components of Latin American political life. Covers economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Includes Argentina, Chile, Venezuela, and Peru. Cross-listed with LNST 142S. Credit is awarded for only one of LNST 142/POSC 162 or LNST 142S/POSC 162S.

**POSC 163. Ethnic Politics (4)** Lecture, 3 hours; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the politics of ethnicity. Surveys theory and evidence utilizing a wide range of cases from around the world. Credit is awarded for only one of POSC 163 or POSC 163S.

**POSC 163S. Ethnic Politics (5)** Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the politics of ethnicity. Surveys theory and evidence utilizing a wide range of cases from around the world. Credit is awarded for only one of POSC 163 or POSC 163S.

**POSC 164. The Nation State and Capitalism (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers the comparative political economy of advanced industrial countries. Examines forms of capitalism after World War II. Studies political foundations and institutional features and their relation to economic growth, investment, innovation, international trade, employment, and economic quality. Analyzes the impact of globalization on labor relations, social welfare, financial market regulation, and corporate governance. Credit is awarded for only one of POSC 164 or POSC 164S.

**POSC 164S. The Nation State and Capitalism (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers the comparative political economy of advanced industrial countries. Examines forms of capitalism after World War II. Studies political foundations and institutional features and their relation to economic growth, investment, innovation, international trade, employment, and economic quality. Analyzes the impact of globalization on labor relations, social welfare, financial market regulation, and corporate governance. Credit is awarded for only one of POSC 164 or POSC 164S.

**POSC 165. Strategy and Politics (4)** Lecture, 3 hours; individual study, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the formal analysis of politics, the role of strategic behavior, and the importance of political institutions in influencing political outcomes. Covers the basics of social choice and game theory and their applications to strategic voting, bargaining, cooperation, agenda setting, executive vetoes, conflict, and legislative bargaining. Credit is awarded for only one of POSC 165 or POSC 165S.

**POSC 165S. Strategy and Politics (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the formal analysis of politics, the role of strategic behavior, and the importance of political institutions in influencing political outcomes. Covers the basics of social choice and game theory and their applications to strategic voting, bargaining, cooperation, agenda setting, executive vetoes, conflict, and legislative bargaining. Credit is awarded for only one of POSC 165 or POSC 165S.

**POSC 166. Judicial Politics and Policy Making (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination

of the characteristics of judicial bodies, emphasizing their interaction with other policy-makers and social and political problems. Investigates the policy roles of local, state, and lower federal courts and the U.S. Supreme Court.

**POSC 167. Constitutional Law: Fundamental Freedoms (5)** Lecture, 3 hours; discussion, 1 hour; outside research, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the legal and political context in the U.S. of freedom of expression, the press, and religion; separation of church and state; equal rights for women and minorities; voting rights; and citizenship.

**POSC 168. Constitutional Law: Criminal Justice (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of the rights of criminal defendants; the role of lawyers, police, prosecutors, and judges in the criminal process in the United States; and the function of criminal law.

**POSC 169. Terrorism and Political Violence (4)** Lecture, 3 hours; extra reading and term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the nature and origin of political conflict, violence, and rebellion. Examines political violence as a political pathology and as an instrument of supporters and opponents of regimes. Examines types of political violence: terrorism, ethnic and communal conflict, rebellion, and revolutionary and counter-revolutionary violence.

**POSC 170. Local Leadership in California (4)** Lecture, 3 hours; consultation, 1 hour. A survey of the local leadership structure-official and unofficial-in California. An analysis of who decides and influences local policy decisions.

**POSC 171. American State Politics (4)** Lecture, 3 hours. A critical examination of the activities, structure, and function of the states in the American political system. Concern is with the politics and major policy issues of the 50 states, with a special interest in California.

**POSC 172. Urban Politics and Policies (4)** Lecture, 3 hours; term paper and extra reading, 3 hours. Prerequisite(s): upper-division standing; POSC 010 or POSC 010H. A general analysis of urban politics in the United States. Topics include theories of urban politics, structure of political competition, leading political roles, and major policy problems. Cross-listed with URST 172.

**POSC 173. Government and Politics of California (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the political process of California. Focuses on both the electoral and legislative politics and the contribution they make to democratic governance under conditions of social diversity. Credit is awarded for only one of POSC 173 or POSC 173S.

**POSC 173S. Government and Politics of California (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the political process of California. Focuses on both the electoral and legislative politics and the contribution they make to democratic governance under conditions of social diversity. Credit is awarded for only one of POSC 173 or POSC 173S.

**POSC 175H. Introduction to the Honors Thesis (4)** Seminar, 3 hours; outside research, 3 hours.

Prerequisite(s): upper-division standing or consent of instructor. Familiarizes students with the procedures and techniques, from theory construction to data collection and analysis, needed to design and conduct original research for an honors thesis. Satisfactory (S) or No Credit (NC) grading is not available.

**POSC 176H. Seminar on Writing the Honors Thesis (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): POSC 175H; upper-division standing or consent of instructor. Provides guidance for students writing an honors thesis in political science. Topics include bibliographic research, fieldwork, statistics, case study analysis, professional writing, and standards of academic scholarship. Satisfactory (S) or No Credit (NC) grading is not available.

**POSC 177H. Honors Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): POSC 175H; POSC 176H; upper-division standing or consent of instructor. Independent research and preparation of an honors thesis completed under the supervision of a faculty member. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

**POSC 178. Political Consequences of Electoral Institutions (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the structures of the various electoral systems used around the world. Explores how different electoral systems influence the choices made by voters and political candidates. Analyzes how these choices influence factors including representation, accountability, party systems, corruption, and economic growth. Credit is awarded for only one of POSC 178 or POSC 178S.

**POSC 178S. Political Consequences of Electoral Institutions (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of how the wide variety of electoral systems that are used in the world function. Explores how different electoral systems influence the choices made by voters and political candidates. Analyzes how these choices influence factors including representation, accountability, party systems, corruption, and economic growth. Credit is awarded for only one of POSC 178 or POSC 178S.

**POSC 180. The Politics of Public Health (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the social, environmental, and political factors that shape population health. Utilizes public health topics to illustrate the fundamental problems of the politics of regulation and social policy. Credit is awarded for only one of POSC 180 or POSC 180S.

**POSC 180S. The Politics of Public Health (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the social, environmental, and political factors that shape population health. Utilizes public health topics to illustrate the fundamental problems of the politics of regulation and social policy. Credit is awarded for only one of POSC 180 or POSC 180S.

**POSC 181. Public Policy: Values, Conflict, and Politics (4)** Lecture, 3 hours; outside research, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing; POSC 010 or POSC 010H. Introduces methods and approaches used to describe, explain, and evaluate public policies. Examples include group theories, system approaches, program planning, and budgeting systems.

**POSC 182. Politics and Economic Policy (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours.

Prerequisite(s): upper-division standing or consent of instructor. Examines the political and administrative processes of economic policy formation, the rationale of government programs, and the mixture of facts, values, and social forces that determine policy. Emphasizes issues of government-economy interaction emerging under the impact of modern technology.

**POSC 183. Administrative Politics and Theory (4)**

Lecture, 3 hours; outside research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): POSC 010 or POSC 010H; upper-division standing or consent of instructor. An introduction to the politics and theory of public administration. Topics include decision-making processes, leadership, formal and informal organization, and the interrelationships among values, structures, and behavior patterns.

**POSC 184. Digital Government (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores extent to which emerging digital communication technologies transform the institutions and practice of democratic government in the United States. Topics include the impact of emerging communication technology on campaigning, legislative representation, agency rule-making, and deliberation, as well as the legal, regulatory, and political context of public sector technology. Credit is awarded for only one of POSC 184 or POSC 184S.

**POSC 184S. Digital Government (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores extent to which emerging digital communication technologies transform the institutions and practice of democratic government in the United States. Topics include the impact of emerging communication technology on campaigning, legislative representation, agency rulemaking, and deliberation, as well as the legal, regulatory, and political context of public sector technology. Credit is awarded for only one of POSC 184 or POSC 184S.

**POSC 186. Regulation: A Political Perspective (5)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines government regulation from a political perspective, covering both traditional areas of business regulation and the newer social regulation in areas of environment, health and safety, and personal behavior. Evaluates rationales for and against regulation, in theory and through case studies.

**POSC 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): consent of instructor and department chair. Student prepares a written proposal endorsed by a supervising instructor, as a means of meeting individual curricular needs. Course is repeatable to a maximum of 15 units.

**POSC 196. Moot Court: Legal Research, Writing, and Advocacy (4)** Seminar, 4 hours. Prerequisite(s): senior standing; 3.40 GPA; POSC 167 or POSC 168.

Introduction to the judicial process and legal argument. Explores how attorneys devise and make legal arguments, oral presentations, argument skills, and the basics of legal analysis.

**POSC 197. Research for Undergraduates (1-4)** Outside research, 1-4 hours. Offers opportunity for directed individual research, to result in a substantial paper, when a student wishes to do a deeper study of a topic than is possible in the normal term paper.

**POSC 198G. Field Work in Political Science (4)** tutorial, hours to be announced; assignments, 8 hours. Direct evaluation of the local political process through participant observation, combining academic instruc-

tion and supervised field work. Students will examine firsthand political behavior and the policy process in one location in local political systems. May be repeated once for credit.

**POSC 198-I. Individual Internship in Political Science (1-12)**

Internship, 2-24 hours; reading and writing, 1-12 hours. Prerequisite(s): a GPA of 2.70 or better; upper-division standing; consent of instructor. Intern assignments in major political offices. Students participate in and observe substantive theoretical analyses of political behavior and policy processes. Course is repeatable to a maximum of 16 units.

**POSC 199. Senior Research (1-4)** Outside research, 3-12 hours. Prerequisite(s): upper-division standing and consent of instructor. Independent work under the direction of members of the staff. The project may be undertaken as a one-, two-, or three-quarter sequence. In the case of a two- or three-quarter sequence, the final grade may be deferred until completion of the last quarter. Course is repeatable to a maximum of 12 units.

## Graduate Courses

**POSC 201. Introduction to Political Inquiry (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the logic of political inquiry. Problems of theory-building, research design, case selection, and measurement are covered in the context of quantitative and qualitative political research.

**POSC 202A. Survey of Quantitative Methods (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): POSC 201 or approval of department graduate committee. Introduction to statistical analysis. Topics include descriptive statistics, probability, sampling distributions, parameter estimation, hypothesis testing, correlation, and bivariate regression analysis.

**POSC 202B. Survey of Quantitative Methods (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): POSC 201 or approval of department graduate committee. Covers data analysis for political science applications. Topics include Statistical Package for the Social Sciences (SPSSX), regression analysis, causal modeling, factor analysis, and cluster analysis in research design context.

**POSC 203. Social Science, History, and Qualitative Methodology (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the basic epistemology of qualitative social science. Provides students with a working knowledge of the strengths and weaknesses of the historical and comparative case study approaches to social science.

**POSC 204. Mathematical Modeling in Political Science (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Survey of basic mathematical tools relevant to research in political science and other disciplines of the social sciences, with an emphasis on concepts and applications. Topics include sets, matrix algebra, comparative-static analysis, optimization problems, exponential and logarithmic functions, equality constraints in optimization, and integration.

**POSC 205. Advanced Regression Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): POSC 202B. Introduction to the use of advanced techniques in regression analysis. Topics include model specification, measures of goodness of fit, two-

stage least squares, and models with binary dependent variables.

**POSC 206. Environmental Policy and Law (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing, POSC 010 or POSC 010H, POSC 020 or POSC 020H; or consent of instructor. An introduction to the process and politics of environmental regulation in the United States and the negotiation and implementation of international environmental accords. Uses social scientific methods of analysis to investigate specific issues such as air quality, energy, and biodiversity. Cross-listed with ENSC 206.

**POSC 207. Advanced Quantitative Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MATH 005, POSC 202B; or consent of instructor.

Introduction to the use of advanced techniques in quantitative analysis. Topics include maximum likelihood, sample selection bias, simultaneous equations.

**POSC 208. Seminar in Representation (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines representation in America. Topics include what it means to represent; the different means of representation; to what degree the elected behave consistently with constituents' preferences; and the accountability of elected officials. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**POSC 212. Political Theory (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A survey of general issues in political theory. Proponents covered may include Plato, Montesquieu, Weber, Arendt, Rawls, Foucault, and others. Debate models covered may include hermeneutics and normativity vs. science; power vs. truth; and democracy vs. liberalism. Course is repeatable as content changes to a maximum of 12 units.

**POSC 213. Rhetoric and Argument in Ancient China and Greece (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A study of theories and practices of rhetoric, argument, persuasion, and, in some cases, poetics in ancient China and Greece (texts dating from the fifth to the third centuries B.C.), as well as some of their implications for contemporary theory and practice. Students who submit a seminar paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. This course may also be taken on a Satisfactory (S) or No Credit (NC) basis by students advanced to candidacy for the Ph.D. Cross-listed with CPLT 213.

**POSC 215. Political Economy of International Finance (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Conducts a broad theoretical and historical survey of the politics and economics of international money and finance. Topics include monetary and exchange rate regimes, foreign direct investment, capital flows, sovereign debt, financial regulation and international macroeconomic coordination, the role of finance in economic development, and international financial crises.

**POSC 216. International Relations (4)** Lecture, 3 hours. Prerequisite(s): consent of instructor. Historical development and present range of political thought on relations among nations, origins and implications of the idea of sovereignty, the theory of an international community, theories of imperialism. The analysis of selected contemporary problems—bipolarity, emergent nations, alliance systems in the light of recent contributions to international relations theory.

**POSC 217. Comparative Politics (4)** Lecture, 3 hours. Survey and introduction to comparative politics with emphasis on major ideas, trends, and issues in the field. Critical assessment of the literature on systems, political culture, development and underdevelopment, and elites.

**POSC 220. Politics of Race, Immigration, and Ethnicity (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the politics of race, immigration, and ethnicity in the United States, including comparisons to ethnic politics in other regions of the world. Emphasizes the role of political institutions and processes in making race, immigration, and ethnicity more or less salient in elections, legislation, social movements, and interpersonal and intergroup relations. Course is repeatable as content changes to a maximum of 8 units.

**POSC 225. Formal Analysis (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the use of formal theory in political science. Covers the basics of game theoretical analysis and applications to substantive issues in the discipline. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 8 units.

**POSC 227. Seminar in Religion and Politics (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A critical examination of the relationship between religion and politics from a comparative perspective. Studies politicization of religion in political issues such as secularism, gender rights, minority rights, terrorism, civil conflict, foreign policy, political Islam, and Christian democracy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 8 units.

**POSC 230. Research Colloquium in Political Science (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides training in full and effective engagement in scholarly inquiry and exchange. Utilizes tiered participation in student and faculty presentations. Includes discussion of current research in the fields of political science such as American politics, comparative politics, international relations, mass politics, and political theory. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 18 units.

**POSC 231. Proseminar on Research in Political Science in International Relations and Foreign Policy (1)** Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Presentations by students, departmental faculty, and visiting scholars describing current research in political science in the areas of international relations and foreign policy. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

**POSC 249. American Politics (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys major theoretical approaches to the study of American politics and enduring research questions in the field. Topics vary and could include the politics of race and ethnicity, the historical development of government institutions, political parties, voting behavior, federalism, and the policy-making process in the United States. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 8 units.

**POSC 250. Seminar in Politics and the Legal Order (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive reading and research on selected topics in politics and the legal order, such as law and social change, compliance with judicial decision making, and important areas of constitutional law.

**POSC 251. Seminar in Urban Analysis and Issues (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of selected topics bearing on urban phenomena. Topics include theoretical approaches to urban politics, reform issues, specific policy concerns, and sources of conflict in urban settings.

**POSC 252. Public Policy (4)** Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores approaches to public policy analysis, emphasizing interaction between substance and process in policy development. Covers both theories and concrete case studies; special attention given to the administrative stage of policy development.

**POSC 253. Constitutional Law (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Designed to acquaint students with the issues and questions that structure debate in the constitutional arena. Students read and analyze court opinions dealing with such topics as doctrines of access to the courts, intergovernmental relations, and civil rights and liberties.

**POSC 254. Seminar on the U.S. Congress (4)** Seminar, 3 hours. An examination of major research on the U.S. Congress. Emphasis will be placed upon substantive questions requiring further research and upon methodological techniques appropriate to such research.

**POSC 255. Seminar in American Electoral Behavior (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the literature on electoral behavior in the United States. Focuses on the major models of voting behavior developed since 1945. In addition, issues such as voter turnout, economic voting, and presidential primaries are covered.

**POSC 256. Seminar in Public Opinion and Mass Media (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores classic and contemporary research on public opinion and mass media. Topics in public opinion include political socialization, attitude constraint, and theories of attitude change. Topics in mass media include agenda setting and framing effects.

**POSC 257. Comparative Political Behavior and Elections (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines issues in the theoretical literature on voting studies by using examples mainly from outside the U.S.

**POSC 258. Congressional Elections (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Congressional elections is a growing field of inquiry in American electoral politics. Much scholarly debate has been generated over a variety of phenomena in this area. This seminar provides an overview of a number of these controversies and offers students the conceptual framework to critically analyze a rather large body of literature.

**POSC 259. Women and the American Political Process (4)** Seminar, 3 hours; outside research, 3

hours. Prerequisite(s): graduate standing or consent of instructor. An examination of the role of women in the American political process. Topics include the women's movement as a social movement and as an interest group, women as voters, candidates and office holders, and women's issues and the public policy process.

**POSC 260. Economics and Elections (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the impact of issues and economic conditions on voting behavior in elections, with primary focus on United States presidential elections. The roles of campaigns and information are also covered.

**POSC 261. American Political Institutions (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys the principal theoretical and empirical issues involved in the study of American political institutions. Covers the major U.S. national political institutions, including Congress, the presidency, the judiciary, the bureaucracy, interest groups, and political parties.

**POSC 262. War Termination and Conflict Resolution (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers competing explanations of why and when conflicts come to an end. Focuses on international and civil wars. Addresses questions such as the following: Why do civil wars last longer than international ones? Why are civil wars difficult to settle through negotiation? What impact does domestic politics have on international war termination?

**POSC 263. Seminar on Conflict and Peace (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers some of the principal problems, issues, and findings in the study of the causes and consequences of war. Focuses on a number of key variables and their links to war under certain conditions and introduces students to standard data sources.

**POSC 264. Seminar in International Political Economy (4)** Seminar, 3 hours; consultation, 1 hour. Examination of major economic institutions, developments, and forces in world politics, with emphasis on contending theoretical approaches, issues in North-South relations, and consequences for regional and national political-economic development.

**POSC 266. Political Economy of Growth (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): POSC 202A, POSC 202B; or consent of instructor. Examination of political and economic aspects of growth using a formal and quantitative approach. Topics include political institutions, social development, economic growth, and democratization. Emphasis is on the interaction and causality between political and economic variables.

**POSC 267. Ethics and International Politics (4)** Seminar, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing or consent of instructor. Examines ethical debates in the field of international politics. Topics include just war theory, humanitarian aid, military intervention, international justice and human rights, aggression, peace-keeping, and global inequality. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for only one of POSC 135 or POSC 267.

**POSC 268. Human Rights (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of instructor is required for students repeating the course. Surveys the primary theoretical and empirical issues in the

study of human rights. Explores major themes and contemporary topics, including, but not limited to, cultural relativism, the evolution of the human rights regime, and the impact of globalization, domestic, and international institutions. Course is repeatable as content changes to a maximum of 8 units.

**POSC 271. Comparative Political Economics (4)** Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Past attempts to address such questions as "What part does government play in the economy?" have been made within the disciplinary boundaries of political science or economics. Such questions, however, cut across the domains of economics and political science, and the new political economy attempts to integrate theories and insights from both disciplines. This course will examine this literature to see how successful it has been in explaining important aspects of the interrelationship between politicians and the economy.

**POSC 272. Parties and Party Systems in Western Europe (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines some of the literature on parties and party systems in Western Europe, with special attention to the role of such systems in modern representative democracies and to debates in the literature on this topic.

**POSC 273. Rational Choice in Comparative Politics (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The rational choice approach has begun to gain favor among a number of comparativists working on a variety of questions. This seminar critically reviews and discusses the contribution the rational choice perspective has made as well as the debates it has sparked.

**POSC 274. The Armed Forces and Politics (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the role of the armed forces in political society, covering western-democratic, communist, postcommunist, and third world systems. Comparisons of civil-military relations across regions are made, with an emphasis on military political intervention and civilian control strategies.

**POSC 276. Democracy and Democratization (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Addresses topics and readings on democracy and democratization within the field of comparative politics. Covers arguments between democracy and democratization across regions and time. Explores the relative impact of economic, social, and political factors in the emergence of democracy and conditions sustained therein. No.

**POSC 278. Seminar in Latin American Politics (4)** Seminar, 3 hours. Critical examination of fundamental issues of Latin American politics with attention to varying interpretations and approaches to the study of elites and masses, power and class conflict, development and underdevelopment.

**POSC 279. Asian Political Economy in Comparative Perspective (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the political economy of late development, particularly in East Asia, including rival forms of institutional analysis, case studies versus comparative analysis, and the particular data and methodological challenges of fieldwork-based analysis.

**POSC 280. Seminar in Political Theory (4)** Seminar, 3 hours; extra reading, 2 hours; outside research, 1

hour. Prerequisite(s): consent of instructor. A detailed study at an advanced level of political theories and concepts and the writings of their major theorists. Themes and eras covered vary each quarter. Course is repeatable as content changes to a maximum of 12 units.

**POSC 281. Seminar in the History of Political Thought (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced study of the methodology and practice of research in the history of political thought. Course is repeatable as content changes to a maximum of 12 units.

**POSC 282. Political Theory and Policy Analysis (4)** Seminar, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of the literature focusing on the analysis of individual behavior within various types of institutional arrangements. Introduces a diversity of work oriented in rational choice theory, broadly defined. Emphasis is placed on applying institutional analysis to legislative, bureaucratic, and so-called informal institutions.

**POSC 283. Political Thinkers in Depth (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores in depth one or more great political thinkers from around the world. Focuses on methodologies of research and interpretation. May include works by Plato, Confucius, Machiavelli, Marx and Engels, John Stuart Mill, or Gandhi. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

**POSC 285. Professional Research Paper (4)** Outside research, 12 hours. Prerequisite(s): graduate standing or consent of instructor. An independent study course focusing on writing a substantial research paper, emphasizing research design problems. Must be accomplished within two quarters following doctoral qualifying examinations. If completed in one quarter, a grade will be assigned for 4 units. If two quarters are necessary, course will be graded In Progress (IP) until both terms are completed when the final grade will be assigned for 8 units. Course is repeatable to a maximum of 8 units.

**POSC 290. Directed Studies (1-6)** variable hours. Prerequisite(s): consent of instructor. Advanced work in a topic or topics appropriate to the student's special interests and needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**POSC 291. Individual Study in Coordinated Areas (1-12)** Prerequisite(s): consent of instructor. A program of study designed to advise and assist candidates who are preparing for doctoral examinations. Does not count toward the unit requirement for the master's degree. Graded Satisfactory (S) or No Credit (NC). May be repeated up to a total of 16 units.

**POSC 292. Concurrent Analytical Studies in Political Science (2-4)** Outside research, 8-16 hours. Prerequisite(s): consent of instructor. Each 292 course is taken concurrently with a 100-series course but on an individual basis. Students complete a graduate-level paper based on research or criticism related to the 100-series course. Faculty guidance and evaluation is provided throughout the quarter. POSC 114, POSC 114H, POSC 114S, POSC 142 (E-Z), POSC 186, POSC 190, POSC 196, POSC 197, POSC 198G, POSC 198I, and POSC 199 may not be used for this course arrangement. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**POSC 293. Research Topics in Political Science (1)** Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Lectures and discussions by invited scholars and faculty on selected research topics in political science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

**POSC 297. Directed Research (1-6)** Outside research, 3-18 hours. Individual research performed under the direction of a faculty advisor. Designed for students preparing their dissertation prospectuses. Students meet in groups by appointment with a faculty advisor to discuss issues of dissertation writing. Emphasis is placed on the development of research design. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 18 units.

**POSC 299. Research for Thesis or Dissertation (1-12)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**POSC 301. Teaching of Political Science at the College Level (2)** Seminar, 1 hour; practicum, 3 hours. Prerequisite(s): graduate standing in Political Science. A program of weekly meetings and individual formative evaluation required of new Political Science Teaching Assistants. Covers instructional methods and classroom/section activities most suitable for teaching Political Science. Conducted by departmental faculty or the Teaching Assistant Development Program. Graded Satisfactory (S) or No Credit (NC).

**POSC 302. College Teaching Practicum (1-4)** Practicum, 2-8 hours; consultation, 1-4 hours. Prerequisite(s): graduate standing and consent of instructor. Required of all teaching assistants in the department. Credit not applicable to graduate unit requirements. Supervised teaching in college level classes under the supervision of the course instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Population Biology

### College of Natural and Agricultural Sciences

The interdepartmental Ph.D. program in Population Biology is not currently accepting new students. For further information call (800) 735-0717 or (951) 827-5621.

## Psychology

### Subject abbreviation: PSYC College of Humanities, Arts, and Social Sciences

B. Glenn Stanley, Ph.D., Chair  
Department Office, 1200 Psychology  
Psychology; (951) 827-7792

Undergraduate Advising Office  
1200 Psychology  
(951) 827-5386; [psych.ucr.edu](mailto:psych.ucr.edu)

**Professors**

G. John Andersen, Ph.D.  
 Curt Burgess, Ph.D.  
 Ruth K. Chao, Ph.D.  
 Christine Chiarello, Ph.D.  
 Steven E. Clark, Ph.D.  
 M. Robin DiMatteo, Ph.D.  
 Howard S. Friedman, Ph.D.  
 David C. Funder, Ph.D.  
 Mary Gauvain, Ph.D.  
 Nancy G. Guerra, Ph.D.  
 Sonja Lyubomirsky, Ph.D.  
 Carolyn B. Murray, Ph.D.  
 Daniel J. Ozer, Ph.D.  
 Lawrence D. Rosenblum, Ph.D.  
 Robert Rosenthal, Ph.D.  
 B. Glenn Stanley, Ph.D. (Psychology/Cell Biology and Neuroscience)

**Professors Emeriti**

Arlo K. Myers, Ph.D.  
 Marvin Nachman, Ph.D.  
 Lewis Petrinovich, Ph.D.  
 Robert D. Singer, Ph.D.  
 Ovid J.-L. Tzeng, Ph.D.  
 David H. Warren, Ph.D.  
 Paul D. Wilson, Ph.D.

**Associate Professors**

Peter W. Hickmott, Ph.D.  
 Chandra A. Reynolds-Gebelin, Ph.D.  
 Rebekah Richert, Ph.D.

**Assistant Professors**

Kelly Huffman, Ph.D.  
 Edward Korzus, Ph.D.  
 Sara Mednick, Ph.D.  
 Misaki N. Natsuaki, Ph.D.  
 Khaleel Razak, Ph.D.  
 Aaron Seitz, Ph.D.  
 Kate Sweeny, Ph.D.  
 Thomas Sy, Ph.D.  
 Tuppet M. Yates, Ph.D.

\*\*

**Cooperating Faculty**

Robert C. Calfee, Ph.D. Graduate School of Education

## Majors and Career Opportunities

The major in Psychology is designed to give students a broad, general exposure to knowledge in the various areas of psychology and to the methods psychologists use to conduct research. The B.A. degree in Psychology is useful to those students seeking careers in probation and parole, corrections, personnel, industrial relations, mental health work, social work, or positions as trainees in a variety of executive training programs. The degree also prepares students for graduate school in psychology in either M.A. or Ph.D. programs. Such graduate programs prepare students for a variety of career possibilities. Careers include teaching and research positions in community and private colleges and state and other universities as well as career positions such as research psychologist, clinical psychologist, counseling psychologist, and industrial psychologist. For more information, see [psych.ucr.edu](http://psych.ucr.edu).

The department offers a minor in Psychology and a major in Psychology/Law and Society.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

The lower-division biological, physical sciences, and mathematics requirements for the Psychology major also count toward the college's Natural Sciences and Mathematics breadth requirement. Consult with a departmental advisor.

## Major Requirements

### Psychology Major

Psychology offers B.A. and B.S. degrees. The Psychology major requires completion of the lower-division requirements listed below by the end of the sophomore year, with an average grade of "C" or better with no grade below a "C-", before upper-division Psychology courses are taken. All courses must be taken for a letter grade.

**Change of Major Students** Students switching to the Psychology Major must have completed the following courses with grades of C- or better and have been in good academic standing for two quarters or more.

1. Lower Division requirements
  - a. MATH 004 or MATH 005 or MATH 008A or MATH 009A
  - b. PSYC 001, PSYC 002

Transfer students and others entering the major after achieving sophomore standing must complete the requirements within one year by enrolling in applicable courses every quarter until the requirement is met. Students who do not complete the lower-division requirements in this timely fashion and with at least the minimum required grade average will not be permitted to continue in the Psychology major. Students must check course descriptions for prerequisite requirements.

**For the Bachelor of Arts** The major requirements for the B.A. degree in Psychology are as follows:

1. Lower-division requirements (40 units)
  - a) One course in Mathematics chosen from MATH 004, MATH 005, MATH 008A, or MATH 009A
  - b) One course in biological sciences chosen from BIOL 002 or both BIOL 005A and BIOL 05LA, BIOL 003 or BIOL 005B, BIOL 005C, BIOL 034
  - c) One course in physical science chosen from
    - (1) CHEM 001A, CHEM 001B, CHEM 001C (and CHEM 011A, CHEM 011B, CHEM 011C), CHEM 003
    - (2) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 007, PHYS 008, PHYS 010, PHYS 012, PHYS 016, PHYS 018, PHYS 020, PHYS 021,

PHYS 022, PHYS 024, PHYS 040A, PHYS 040B, PHYS 040C

- (3) Any Geosciences courses except for cultural geography courses
  - d) Two additional courses chosen from b) or c) above, any Computer Science course, any Statistics course, any Mathematics course except those listed in a) above.
  - e) PSYC 001, PSYC 002, PSYC 011, PSYC 012
2. Upper-division requirements (37 units)
    - a) PSYC 110 or CBNS 106
    - b) PSYC 140, PSYC 150
    - c) PSYC 132 or PSYC 134
    - d) PSYC 160
    - e) Four additional 4-unit, upper-division Psychology courses. Only one 4- to 5-unit quarter of PSYC 198G, or one 4- to 8-unit quarter of PSYC 198I may be included. No 190-series courses other than PSYC 198G or PSYC 198I may be used. Students planning for graduate school should take into consideration any specific graduate school requirements when choosing these elective Psychology courses.

**Note** Students who have taken general or introductory Psychology courses other than PSYC 001 and PSYC 002 must consult with a departmental advisor.

**For the Bachelor of Science** The major requirements for the B.S. degree in Psychology are as follows:

The B.S. degree is designed to provide a research-intensive curriculum for students who want a deeper understanding of how knowledge is created through research and for students who may be interested in research-based graduate programs in psychology and the biological sciences.

Psychology courses must be taken for a letter grade. Students must check course descriptions for prerequisite requirements.

**Admission** A limited number of students are accepted into the B.S. degree of the Psychology major. Acceptance is according to overall GPA and acceptable progress towards the Psychology major, including PSYC 001, PSYC 002, PSYC 011 and PSYC 012 with a B- or better. Students must apply when they have completed between 75 and 100 quarter units of college work.

1. Lower-division requirements for the B.S. (40 units)
  - a) One course in Mathematics chosen from MATH 004, MATH 005, MATH 008A, or MATH009A
  - b) One course in biological sciences chosen from BIOL 002 or both BIOL 005A and BIOL 05LA, BIOL 003 or BIOL 005B, BIOL 005C, BIOL 034
  - c) One course in physical science chosen from

- (1) CHEM 001A, CHEM 001B, CHEM 001C (and CHEM 011A, CHEM 011B, CHEM 011C), CHEM 003
  - (2) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 007, PHYS 008, PHYS 010, PHYS 012, PHYS 016, PHYS 18, PHYS 020, PHYS 021, PHYS 022, PHYS 024, PHYS 040A, PHYS 040B, PHYS 040C
  - (3) Any Geosciences courses except for cultural geography courses
  - d) Two additional courses chosen from b), or c) above, any computer science course, any statistics course, any math course except those listed in a) above
  - e) PSYC 001, PSYC 002, PSYC 011, PSYC 012 with no grade below a B-
2. Upper-division requirements for the B.S. (37-43 units)
    - a) PSYC 109
    - b) PSYC 110 or CBNS 106
    - c) PSYC 140, PSYC 150
    - d) PSYC 132 or PSYC 134
    - e) PSYC 160
    - f) Any two of the following: CBNS/PSYC 120L, PSYC 180, PSYC 181, PSYC 182 (E- Z), PSYC 195, PSYC 197 (for a total of 4 units, letter grade required), PSYC 199H
    - g) One of the following: PSYC 136, PSYC 139, PSYC 148, PSYC 169. One of the following graduate seminars may be substituted, with permission of the instructor: PSYC 251, PSYC 255, PSYC 256, PSYC 257, PSYC 258, PSYC 263
    - h) One additional 4-unit, upper-division Psychology course. No 190- series courses other than PSYC 198G or PSYC 198I may be used.

### Psychology/Law and Society Major

1. All requirements for the B.A. in Psychology (39 lower-division units, which includes 16 units that are also used for college breadth requirements; 36 upper-division units)
2. Requirements for Law and Society (36 units)
  - a) PHIL 007 or PHIL 007H
  - b) LWSO 100
  - c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
  - d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
  - e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
  - f) LWSO 193, Senior Seminar

**Note** For sections 2.d) and 2.e) combined, not more than two courses may be taken from the

same department. In fulfilling requirements of two or more majors, students may not count more than two courses toward both parts of their total requirements. For this major, PSYC 012 fulfills a requirement in both Psychology and Law and Society.

### Minor

Prerequisites for the minor in Psychology are PSYC 001, PSYC 002, PSYC 011, and PSYC 012, with an average grade of "C" or better, with no grade below a "C-".

Requirements for the Psychology minor are as follows (21 units):

1. Twenty-one (21) upper-division Psychology units
  - a) PSYC 110 or CBNS 106
  - b) PSYC 132 or PSYC 134
  - c) PSYC 140 and PSYC 150
  - d) PSYC 160

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

### Psychology Undergraduate Honors Program

The Psychology Undergraduate Honors Program has been discontinued. For more information please contact the Undergraduate Advising Office, 1331 Olmstead, (951) 827-5386.

### Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

### Graduate Program

The Department of Psychology offers the M.A. and Ph.D. degrees in Psychology; however, applications are not accepted from students wishing to work towards the master's degree only.

Graduate training in Psychology is offered in four major areas: Cognitive, Social/Personality, Developmental, and Systems Neuroscience.

**Admission** Students are normally expected to have completed the equivalent of an undergraduate major in Psychology at the UC, with background preparation in basic science and

mathematics. Applicants for graduate status must provide scores for the GRE General Test (verbal and quantitative) prior to admission.

The Ph.D. degree is a research degree. Students must demonstrate the ability to complete rigorous empirical research and must be active in research throughout their graduate career. The course requirements in the Ph.D. program are directed toward establishing a foundation for critical evaluation of research literature and designing conceptually important empirical research.

### Doctoral Degree

**Course Work** The courses normally required during the first two years include the following:

1. PSYC 211, PSYC 212, PSYC 213 (Systems Neuroscience students take two of the three, as directed by the student's advisor.)
2. The appropriate area core:
  - Cognitive: PSYC 203A, PSYC 203B, PSYC 203C, PSYC 233
  - Developmental: PSYC 207A, PSYC 207B, PSYC 207C, PSYC 208
  - Social/Personality: PSYC 225, PSYC 226, PSYC 227
  - Neuroscience: NRSC 200A/PSYC 200A, NRSC 200B/PSYC 200B, NRSC 200C/PSYC 200C

3. Five additional courses or seminars selected to provide further study beyond the area core course requirements. Courses or seminars must be 3- or 4-units, and at least one must be a Departmental core course (listed in 2, above) outside the student's area of specialization.

The student's adviser and the department graduate adviser must approve the list of courses used to satisfy this further study requirement. Students who have completed graduate-level course work prior to entering the UCR program may request that specific courses be accepted toward the satisfaction of this requirement. This request will be reviewed using procedures and standards typically applied to the approval of courses to satisfy this requirement.

4. PSYC 301: Required of all graduate students prior to or concurrent with the first teaching assistant appointment unless waived by petition due to previous experience

The Psychology Department requires that each student earn a "B" average in the PSYC 211, PSYC 212, and PSYC 213 sequence and in the student's area core courses, with no grade lower than a "B-".

In addition, students must be enrolled in the appropriate area of Proseminar every quarter until advancement to candidacy:

- Cognitive: PSYC 283
- Developmental: PSYC 284
- Social/Personality: PSYC 285

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Neuroscience: PSYC 251 or PSYC 263 or PSYC 287 or PSYC 289

Progress in the program is formally evaluated in June of each year and informally on a continuing basis by noting participation in class and in research.

All students in the graduate program are held to these requirements whether or not they have taken graduate work at, or hold an M.A. from, another institution. The only exception may be for previously-taken graduate-level course work which is thought to be equivalent to one or more of PSYC 211, PSYC 212, or PSYC 213. If a grade of "B" or better was received, and with the approval of the advisor, the student may be tested by a departmental instructor of the course(s) in question. On the basis of the results of the test, the instructor decides if the course can be waived.

**Master's Degree** Although there is not a separate terminal master's program, students may apply for the master's degree at the beginning of the quarter in which they expect to complete the statistical sequence, the appropriate area core, two of the five further study courses, PSYC 301 (see 1, 2, 3, and 4 above), and a minimum of 36 units in graduate status (of which at least 18 must be in graduate course work) and pass an oral comprehensive examination administered by the Psychology Department.

**Teaching Experience** Each student must gain experience in a teaching capacity for the equivalent of at least three full quarters. Teaching assistants assist a faculty member in an undergraduate course by preparing and grading examinations, reading papers, lecturing, and conducting discussion and laboratory sections.

**Written and Oral Qualifying Examinations** The qualifying examination should be taken during the third year of full-time graduate study. It consists of a written component and an oral examination, and focuses on the subject matter in the student's chosen area of concentration.

A qualifying committee should be nominated early in the third year, and all core and breadth requirements must be completed no later than the quarter in which the qualifying examination is taken.

On the basis of this examination (and completion of the core and breadth requirements), the student may pass and be advanced to candidacy for the Ph.D.; fail, and be permitted one retake; be awarded the M.A. (if not previously awarded) but not be advanced to candidacy for the Ph.D.; or not be awarded the M.A. and not be advanced to candidacy for the Ph.D.

Upon successful completion of 1, 2, 3, and 4, passing the qualifying examination, and nomination of the dissertation committee, the Graduate Division sends the student an application for advancement to candidacy.

**Dissertation and Final Oral Examination** Students must complete a dissertation on a subject chosen

by the candidate, bearing on the principal area of concentration and showing the student's ability in independent investigation. The dissertation committee guides the student in preparing the dissertation and examines the student during the defense of the dissertation.

Each of the four major areas may have additional requirements. Occasionally, a change in courses used to satisfy specific requirements may be justifiable. For a complete description of the program, visit [psych.ucr.edu](http://psych.ucr.edu).

**Normative Time to Degree** 15 quarters

### Minor in Quantitative Psychology

In addition to pursuing a doctoral degree in one of the core areas of psychology, graduate students may qualify, under the direction of the committee in charge of the quantitative minor, for a minor in Quantitative Psychology by completing the following:

1. PSYC 211, PSYC 212, and PSYC 213, with a grade of "A-" or better in each course, or passing an examination covering the three courses
2. Three advanced quantitative courses: PSYC 259 (with different subtitles) or other courses specifically approved by the committee in charge
3. Three quarters of PSYC 270
4. Successful completion of an oral qualifying examination based upon a paper written by the student on a quantitative topic.

A three-person faculty qualifying committee, approved by the chair of the committee in charge, must grant prior approval of the topic of the paper and conduct the oral examination. The candidate and the committee determine the format of the oral exam; a presentation in PSYC 270 based on the paper satisfies the oral examination requirement.

### Opportunities for Graduate Study in Neuroscience

Faculty from the Department of Psychology participate in a unique graduate specialization in Neuroscience which draws on the strengths of distinguished scientists from several units. For further information concerning work in this area, see Neuroscience Graduate Program in the Programs and Courses section of this catalog.

## Lower-Division Courses

**PSYC 001. Introductory Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none; enrollment priority is given to Psychology majors and Social Relations majors. An introduction to psychology as an experimental science. Emphasizes topics in cognitive (including learning, memory, sensation, perception), comparative, and physiological psychology.

**PSYC 002. Introductory Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none; enrollment priority is given to Psychology majors and Social Relations majors. Emphasizes topics in devel-

opmental psychology, tests and measurements, social psychology, personality, and abnormal behavior.

**PSYC 011. Psychological Methods: Statistical Procedures (5)** Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): MATH 004 or MATH 005 or MATH 008A with a grade of "C-" or better; PSYC 001 and PSYC 002 with grades of "C-" or better; enrollment priority is given to Psychology majors. Covers descriptive and inferential statistics, measures of central tendency, variability, and correlation. Introduces sampling distributions, statistical inference, and hypothesis testing.

**PSYC 012. Psychological Methods: Research Procedures (6)** Lecture, 3 hours; laboratory, 3 hours; outside research, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): ENGL 001B or equivalent with a grade of "C" or better; PSYC 001, PSYC 002, PSYC 011 with grades of "C-" or better; consent of instructor is required for students repeating the course; enrollment priority is given to Psychology majors. A systematic survey of research methodologies in psychology. Laboratory assignments include evaluating and testing psychological theories; assessing methodologies and research designs; designing and implementing research; collecting data and analyzing statistics; writing research reports; and discussing ethical issues in science.

**PSYC 013. Skepticism and Pseudoscience in Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): a grade of "C-" or better in ENGL 001A or consent of instructor. Studies topics at the borderland of psychology (e.g., extra-sensory perception, repressed memory, pseudoscientific beliefs, parapsychology, psychic phenomena, faith healing, mass hysteria). Explores the relationship among skepticism, cynicism, and "gullibility" and the rhetoric of extraordinary claims. Stresses the development of scientific literacy, critical thinking skills, hypothesis testing, and understanding psychology as an empirical science.

**PSYC 049. Topics in Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Explores a topic of general interest in psychology. Debate and dialog are the distinguishing features of this course. Topics are announced in the *Schedule of Classes*. Course is repeatable as topics change to a maximum of 16 units.

**PSYC 096. Research for Lower-Division Students (1-2)** scheduled research, 3-6 hours. Prerequisite(s): freshman or sophomore standing and consent of instructor. An introduction to research in psychology. Emphasis upon aspects of library and laboratory research within the content of ongoing faculty research programs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

## Upper-Division Courses

**PSYC 109. Advanced Research Methods (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, each with a grade of "B-" or better; or equivalents; or consent of instructor. Advanced theory and practice of planning, conducting, reporting, and evaluating research in the social and behavioral sciences. Students conduct original research that, if desired, can lead to (and become part of) a senior honors thesis or other senior-level research project. Satisfactory (S) or No Credit (NC) grading is not available.

**PSYC 110. The Brain and Behavior (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002 or BIOL 003 or BIOL 005A or BIOL 034 with a grade

of "C-" or better, or equivalents, or consent of instructor. Explores the principles of neuroanatomy and neurophysiology and their relationship to brain function. Topics include sensory and perceptual processes, biological aspects of learning and memory, motivation, emotion, language, and abnormal behavior. Credit is awarded for only one of CBNS 120/PSYC 120 or PSYC 110.

**PSYC 112. Neural Mechanisms of Animal Behavior (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of "C-" or better or PSYC 110 with a grade of "C-" or better or consent of instructor. Studies how the nervous systems of vertebrates and invertebrates contribute to and control their behavior. Focuses on aspects of sensory physiology with a brief orientation to the structure and function of nervous systems. Emphasizes a top-down approach to neurobiology, with specific behaviors providing guidelines for an examination of neural mechanisms.

**PSYC 115. Drugs and Behavior (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of "C-" or better or PSYC 110 with a grade of "C-" or better or consent of instructor. Describes both legal and illegal drugs. Analyzes drug-nervous system interactions and how the use of various drugs (particularly drugs of abuse) affects behavior and psychological well-being.

**PSYC 117. Cognitive Neuroscience of Memory and Consciousness (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): CBNS 106 with a grade of "C-" or better or PSYC 110 with a grade of "C-" or better. Surveys the neural basis of mental processes, focusing on memory and consciousness and their behavioral manifestations. Emphasizes current research literature.

**PSYC 120. Cellular Neuroscience: Membrane and Synaptic Phenomena (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. An examination of cellular and molecular mechanisms of nervous system function using concepts drawn from the study of vertebrates and invertebrates with emphasis on mammalian systems. Cross-listed with CBNS 120.

**PSYC 120L. Neuroscience Laboratory (2)** Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CBNS 120/PSYC 120 or concurrent enrollment. Laboratory experiments using anatomical, chemical, and physiological research methods fundamental to understanding neurons and neural systems. Cross-listed with CBNS 120L.

**PSYC 121. Developmental Neuroscience (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. A study of the development of nervous systems. Examines the cellular and molecular mechanisms of neural development and the determinants of cell birth and death, axonal pathfinding, neuronal connections, and development of neural systems underlying behavior. Cross-listed with CBNS 121.

**PSYC 124. Systems Neuroscience (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of "C-" or better or consent of instructor. A study of the structure and function of motor and sensory systems in vertebrate and invertebrate nervous systems. Cross-listed with CBNS 124.

**PSYC 125. Neuropharmacology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 120/PSYC 120; previous or concurrent enrollment in CBNS 120L/PSYC 120L and CBNS 124/PSYC 124 recommended. Examines synaptic neurotransmitter systems, mechanisms, and pharmacological agents and

effects, which are fundamental to neural information processing. Cross-listed with CBNS 125.

**PSYC 126. Neuroscience of Learning and Memory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or PSYC 110 or consent of instructor. Covers mechanisms of learning and memory across levels of analysis, including genetic, neuronal, systems and theory. Topics include the multiple memory systems, memory consolidation, working memory, emotional memory, recognition memory, spatial memory, and human amnesia. Cross-listed with CBNS 126.

**PSYC 127. Behavioral Control Systems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 120/PSYC 120; CBNS 124/PSYC 124 strongly recommended. An analysis of the principles of nervous system operation from the processing of sensory inputs for object recognition and localization to the organization of central patterns of generation of sequenced motor output. Cross-listed with CBNS 127.

**PSYC 129. Human Neuropsychology (4)** Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): a grade of "C-" or better in one of the following courses or consent of instructor: CBNS 106, PSYC 110, PSYC 132, PSYC 134, PSYC 135. Surveys how high psychological functions (e.g., perception, memory, language) are organized in the human brain. Special emphasis is on behavioral and cognitive impairments due to brain injury and how they may inform our view of normal cognitive functions.

**PSYC 130. Fundamentals of Learning and Conditioning (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. A survey course that includes both historical and current models of human learning, conditioning, and memory. Provides a good foundation for research or future study in learning and memory by covering fundamental theories established by Pavlov and Skinner while incorporating new theories of human behavioral control.

**PSYC 131. Computational and Mathematical Models in Cognitive Science (4)** Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): a grade of "C-" or better in PSYC 001, PSYC 002, PSYC 011, PSYC 012 or consent of instructor. Introduces students to the technical and theoretical issues involved in using models to understand behavior. Involves analysis of model predictions and simulation of behavioral data. Course is repeatable to a maximum of 12 units if taken with different instructors.

**PSYC 132. Perception (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. An analysis of the role played by sensory mechanisms, experiences, expectations, and needs in recognizing objects in the environment.

**PSYC 133. Human Factors (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): a grade of "C-" or better in one of the following courses or consent of instructor: PSYC 132 or PSYC 134. Provides an overview of the human capabilities and limitations considered in the design of person-machine systems. Evaluates factors critical to performance in person-machine systems, including attention, decision making, motor performance, and memory. **Andersen**

**PSYC 134. Cognitive Processes (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Empirical

and theoretical research in several subareas within contemporary cognitive psychology. These subareas include attention, mental representation, information organization and retrieval from memory, psycholinguistics, problem solving, decision making, thinking, and artificial intelligence and computer simulation of cognitive processes.

**PSYC 135. Psycholinguistics (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012. Introduction to psycholinguistics emphasizing the psychological implications of linguistic theory, including the effect of syntactic structure on the comprehension, production, and retention of speech; the course of language acquisition; and models of the adult language user.

**PSYC 136. Topics in Cognitive Neuroscience (4)** Seminar, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): a grade of "C-" or better in one of the following courses or consent of instructor: CBNS 106, PSYC 110, PSYC 129, PSYC 132, PSYC 134, PSYC 135. Intensive study of selected topics in cognitive neuroscience. Stresses the methodology and interpretation of current research topics. Course is repeatable as topics change to a maximum of 12 units.

**PSYC 138. Sensory Exotica: The Secret Perceptual Skills of Animals and Humans. (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, and PSYC 132 with grades of "C-" or better. Surveys lesser-known sensory mechanisms and perceptual abilities of animals and humans. Topics include echolocation abilities of bats and porpoises; bionavigation in birds; electroreception in fish; pheromones in insects; and echolocation, lipreading, and pheromone sensitivity in humans. Emphasis is on cognitive, neurophysiological, and philosophical implications.

**PSYC 139. Topics in Cognitive Psychology (4)** Seminar, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012; PSYC 132 or PSYC 134 or PSYC 135. Intensive study in cognitive psychology. Stresses literature, methodology, and experimental design and analysis. Course is repeatable as topics change to a maximum of 16 units.

**PSYC 140. Social Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. The relationship between the individual and the group, including such topics as conformity and deviance, attraction and prejudice, altruism and aggression, and the social nature of attitudes.

**PSYC 142. Industrial/Organizational Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 002. Introduction to the field of industrial/organizational psychology covering fundamental theory and research in personnel and organizations. Topics include employee selection and training, performance appraisal, motivation, organizational dynamics, leadership, and job satisfaction.

**PSYC 146. Primate Social Behavior (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 002 or PSYC 002. Considers social organization and behavior in monkeys and apes, with emphasis on the adaptive aspects of social patterns and the relevance of primate studies to human evolution. Cross-listed with ANTH 146.

**PSYC 148. Topics in Social Psychology (4)** Lecture, 3 hours; extra reading or term paper, 3 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 140. Intensive study of selected topics in social psychology such as race relations, attitude formation and change, biases of social science researchers, and the application of psychological principles in community organization. Emphasis is on the study of these areas in natural settings. Specific course content varies. Course is repeatable to a maximum of 16 units.

**PSYC 149. Psychology of Happiness and Virtue (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 and PSYC 002. Covers current theory and research in positive psychology and the scientific study of optimal human functioning. Topics include the causes and benefits of happiness; how happiness can be measured and increased; positive emotions; flow; and human strengths and virtues including optimism, love, altruism, forgiveness, and gratitude.

**PSYC 150. Personality (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. A survey of the principal theories of personality with attention to the experimental methods and findings on which they are based.

**PSYC 152. Abnormal Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. An introduction to the research and theories regarding the major types of abnormal behavior, including the neuroses, schizophrenia, psychosomatic disorders, sexual disorders, drug and stress induced states, and organic disorders.

**PSYC 153. Introduction to Clinical Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 150, PSYC 152. Introduction to the field of clinical psychology with an emphasis on the application and evaluation of techniques of individual and group counseling and therapy and the application and evaluation of psychological tests in the assessment of psychological problems.

**PSYC 155. Personality Assessment (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 150. Covers the assessment of personality through self-report tests, projective tests, and systematic observations. Also entails descriptions of the psychometrics of testing as it applies to the problems in studying personality.

**PSYC 158. Person Perception (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012; PSYC 140 or PSYC 150 (preferably both). Explores "person perception" from the viewpoints of both personality psychology and social psychology. Examines how individuals perceive and judge their own personalities and those of others. Focuses on the processes used in daily life to judge personality and the ways such judgments are erroneous and accurate.

**PSYC 160. Life Span Development (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Introduces the biological, social, and cognitive processes that influence develop-

ment from the prenatal period through late adulthood. Topics include development in physical, motor, perceptual, cognitive, emotional, and social areas. Includes discussion of issues related to intellectual functioning, personality, social roles and relationships, coping and adjustment, and aging.

**PSYC 161. Socioemotional and Personality Development (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. A study of the development of human personality from birth through late adolescence. Emphasizes the impact of interpersonal relationships on the acquisition of human traits, emotional reactions, and patterns of adjustment.

**PSYC 162. Biological Issues in Development (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Examines biological processes that influence behavior and development across the life span. Discusses contemporary theoretical approaches to the study of biological, genetic, and environmental influences on development. Topics include behavioral genetics, developmental neuroscience, and the impact of early environments and stress on adaptation and resilience.

**PSYC 163. Cognitive Development (5)** Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. An analysis of intellectual development from birth through maturity and into stages of aging. Discusses historical and contemporary theoretical and experimental approaches to studying the mechanisms of intellectual growth and development.

**PSYC 164. Emotional and Behavioral Disorders of Childhood (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 152, and PSYC 160 with grades of "C-" or better; or equivalents; or consent of instructor. Provides an overview of behavioral and emotional disorders affecting children and adolescents within a developmental context. Examines disorders affecting youth in terms of prevalence, developmental course, and theories. Topics include theoretical models of child psychopathology; diagnostic, assessment, and treatment practices; and the descriptive psychopathology of major childhood disorders.

**PSYC 165A. The Cultural Bases of Human Development (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Examines the social, emotional, and intellectual aspects of human development from a cultural perspective. Covers theory, research, and methods of studying the cultural bases of psychological growth. Topics include socialization practices, parenting, social relations, language and cognition, schooling and academic achievement, acculturation, and ethnicity.

**PSYC 165B. The Development of Immigrant and Ethnic Minority Youth (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, and PSYC 160 with grades of "C-" or better; or equivalents; or consent of instructor. Covers current theory and research on the development of immigrant and ethnic minority youth in the United States. Focuses on the social, cultural, and psychological processes influencing the biological, cognitive, and social development of youth from immigrant and ethnic minority families.

**PSYC 166. Adolescence and Emerging Adulthood (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, and PSYC 160 with grades of "C-" or better; or equivalents; or consent of instructor. Covers current theory and research on the periods of development referred to as adolescence and the transition to adulthood. Addresses the demographic, sociocultural, and historical changes that have defined these periods, and key features of these periods including pubertal changes and changes in cognitive and social development.

**PSYC 167. Psychological Development of Black Children (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 002. This course will analyze both the traditional theoretical approaches to the study of Black children and innovative approaches that are currently being developed by Black psychologists. The course will cover topics in the areas of cognitive, social, and personality development. Cross-listed with ETST 167.

**PSYC 168. Psychological Aspects of the Black Experience (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 002. This course examines the interdependence between personal characteristics, Afro-American culture, and the social conditions which foster the Black experience. Group membership, life styles, role factors, and situational settings as social norms will be explored in order to understand the uniqueness of the Black experience. Cross-listed with ETST 168.

**PSYC 169. Topics in Developmental Psychology (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; PSYC 160; or equivalents; or consent of instructor. Intensive study in developmental psychology. Stresses literature, methodology, and experimental design and analysis. Specific course content varies. Course is repeatable to a maximum of 16 units.

**PSYC 171. Psychology of Gender (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): PSYC 012 with a grade of "C-" or better or consent of instructor. Examines psychological theory and research on gender, including ethnic and cultural variations in male and female experience. Topics include gender roles, gender development, gender differences and stereotypes, biological influences on gender, gender and health, gender and language, gender and achievement, and men and women in the workplace.

**PSYC 175. Psychology and Law (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): LWSO 100 with a grade of "C-" or better or PSYC 001 and PSYC 002 with grades of "C-" or better. A study of psychological theory and empirical research as it relates to the law. Topics include jury decision making, eyewitness memory, child custody, criminal responsibility and intent, competence, rehabilitation and punishment, ethics and legal responsibilities in therapy, and psychological research.

**PSYC 178. Health Psychology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): HNPG 042K or PSYC 002 or SOC 001 or SOC 001H. An examination of the importance of interpersonal relationships to physical health and effective medical care. Applies social psychological perspectives to such topics as stress-related diseases, placebo effects, doctor-patient interactions, dying, and the hospital environment.

**PSYC 179. Health and Behavior Change (4)** Lecture, 3 hours; discussion, 1 hour; term paper, 1 hour. Prerequisite(s): a grade of "C-" or better in one of the following courses: HNPG 042K, PSYC 002, PSYC 178. Examines psychological constructs in health

behavior change. Covers theories and research on preventive health behavior; adherence to medical treatment; health lifestyles; substance use and abuse; and anxiety and depression in medical illness. Also examines cognitive and behavioral techniques; helping skills; placebo effect; social support; effective therapeutic communication; medical care delivery; and ethical issues.

**PSYC 180. Laboratory in Perception (4)** Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better; concurrent enrollment in or completion of PSYC 132 with a grade of "C-" or better. Provides hands-on computer experience testing phenomena of sensory and perceptual psychology. Students perform experiments in vision, hearing, touch, taste, or smell, using computer software. Students also design, perform, and analyze a novel experiment of their choosing. Discusses the theoretical and practical relevance of all experiments.

**PSYC 181. Laboratory in Cognitive Psychology (4)** Lecture, 3 hours; outside research, 1.5 hours; extra reading, 1.5 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, and PSYC 134 with grades of "C-" or better. Integrates the conceptual and theoretical foundations of cognitive psychology with the mechanics of conducting research. Students develop and design research studies and collect, analyze, and interpret data.

**PSYC 182 (E-Z). Laboratory in Psychology (5)** Lecture, 3 hours; outside research, 3 hours; term paper, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C" or better or consent of instructor; for PSYC 182E: PSYC 160 with a grade of "C" or better or consent of instructor; for PSYC 182F: PSYC 132 with a grade of "C" or better or consent of instructor. Provides the student hands-on experience in various research approaches in psychology. Involves in-class discussion of research design and methods, as well as outside data collection. E. Child Development; F. Sensation and Perception

**PSYC 190. Special Studies (1-5)** Prerequisite(s): upper-division standing with consent of instructor. Individual study under the direction of a faculty member. Course is repeatable to a maximum of 16 units.

**PSYC 191A. Seminar in Developmental Psychology Research (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in developmental psychology. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**PSYC 191B. Seminar in Neuroscience Research (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in neuroscience. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**PSYC 191C. Seminar in Personality Psychology Research (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in personality psychology. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**PSYC 191D. Seminar in Social Psychology Research (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in social psychology. Some combination of

readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**PSYC 191E. Seminar in Cognitive Psychology Research (2)** Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in cognitive psychology. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**PSYC 192H. Junior Honors Seminar (2)** Seminar, 2 hours. Prerequisite(s): junior standing in Psychology and admission to the Psychology Department Undergraduate Honors Program. Presentations by individual faculty members of their research programs; discussions of readings provided by faculty members; discussion of research conceptualization, design, methodology, and statistics; discussion of thesis-writing procedures; peer exchanges. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 6 units.

**PSYC 193H. Senior Honors Seminar (2)** Seminar, 2 hours. Prerequisite(s): senior standing in Psychology; admission to the Psychology Department Undergraduate Honors Program. Presentations by individual faculty members of their research programs; discussions of readings provided by faculty members; discussion of research conceptualization, design, methodology, and statistics; discussion of thesis-writing procedures; and peer exchanges. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

**PSYC 194. Independent Reading (1-4)** Prerequisite(s): upper-division standing with consent of instructor. Individual reading under faculty direction. Course is repeatable to a maximum of 4 units.

**PSYC 195. Senior Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): senior standing in Psychology; consent of instructor. The student works with a faculty member to prepare a thesis based on independent research. Course is repeatable to a maximum of 12 units.

**PSYC 195H. Senior Honors Thesis (2)** Term paper, 6 hours. Prerequisite(s): senior standing in Psychology and admission to the Psychology Department Undergraduate Honors Program. The student will work independently with a faculty member preparing a thesis as a final phase of participation in the program. Satisfactory (S) or No Credit (NC) grading is not available.

**PSYC 197. Research for Undergraduates (1-4)** individual research, 3-12 hours. Prerequisite(s): upper-division standing with consent of instructor. Directed original research. Graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned special projects. Course is repeatable.

**PSYC 198G. Group Internship in Psychology (2-5)** Lecture, 1 hour; internship, 4-10 hours; written assignments, 2-4 hours. Prerequisite(s): PSYC 002 or consent of instructor. Supervised clinical experience in community settings such as mental health clinics, hospitals, and group homes. A written assignment such as a short research paper or a weekly journal is required. Enrollment is for 4 units; a rare exception may be made, in writing, by the instructor for 2, 3, or 5 units. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**PSYC 198H. Junior Honors Research (2)** Outside research, 6 hours. Prerequisite(s): junior standing in Psychology and admission to the Psychology

Department Undergraduate Honors Program. Original research undertaken under the direction of individual faculty members. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 4 units.

**PSYC 198-I. Individual Internship in Psychology (2-8)** Internship, 4-16 hours; consultation, 1 hour; written work, 1-4 hours; individual study, 0-4 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better; upper-division standing; consent of instructor. Individual internship in nonclinical psychology fieldwork. The student spends three hours per week in a prescribed combination of academic activities and internship for each unit of credit. Students keep a weekly log and write a summary of the internship experience. Students who complete additional assigned reading and submit a substantive term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 16 units.

**PSYC 198T. Counseling Skills (1)** Lecture, 1 hour. Prerequisite(s): PSYC 002 or consent of instructor. Focuses on helping skills as applied to the fields of clinical and counseling psychology. Designed for students involved in campus peer counselor settings and future residence hall advisors. Graded Satisfactory (S) or No Credit (NC).

**PSYC 199H. Senior Honors Research (1-5)** Outside research, 3-15 hours. Prerequisite(s): open to senior Psychology majors by invitation. Original research undertaken, by invitation of faculty, under the direction of individual faculty members. Psychology Department Undergraduate Honors Program participants must enroll for 2 units each quarter of their senior year except for the thesis-writing quarter. Satisfactory (S) or No Credit (NC) grading is not available for Honors Program participants; other students may choose Satisfactory (S) or No Credit (NC) grading. Course is repeatable to a maximum of 16 units.

## Graduate Courses

**PSYC 200A. Fundamentals of Neuroscience (3)** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with NRSC 200A.

**PSYC 200B. Fundamentals of Neuroscience (3)** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor; NRSC 200A/PSYC 200A. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with NRSC 200B.

**PSYC 200C. Fundamentals of Neuroscience (3)** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor; NRSC 200B/PSYC 200B. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with NRSC 200C.

**PSYC 203A. Experimental Psychology (3)** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the history and philosophy of cognitive science. Covers the theories and models and gives an empirical overview of perception.

**PSYC 203B. Experimental Psychology (3)** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the theories and models and gives an empirical overview of attention and memory.

**PSYC 203C. Experimental Psychology (3)** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the theories and models and gives an empirical overview of higher level language and memory processes.

**PSYC 207A. Theories in Developmental Psychology (3)** Lecture, 3 hours. Prerequisite(s): consent of instructor. A consideration of major issues and theories in the area of developmental psychology. Theories to be covered include social learning theory, structural theories, sociobiology, and theories of personality development. Topics include life span models and plasticity of human behavior.

**PSYC 207B. Social Development (3)** Lecture, 3 hours. Prerequisite(s): consent of instructor. Theoretical and empirical consideration of various topics in social development, including attachment, aggression, dependency, cooperation, and competition. Students will also consider methodological issues appropriate to investigations of these phenomena.

**PSYC 207C. Processes of Cognitive Development (3)** Lecture, 3 hours. Prerequisite(s): consent of instructor. Examines the cognitive changes in humans throughout the life cycle. Topics include Piagetian theory and memory, information processing, attention, and intelligence with a focus on the changes that occur in these skills.

**PSYC 208. Research Methods in Development (3)** Lecture, 3 hours. Prerequisite(s): PSYC 211; PSYC 212 or consent of instructor. Develops students' skills in evaluating current research methodologies to answer developmental questions and in critically evaluating a variety of research methodologies currently in use. Topics include measurement of developmental dimensions and methods for assessing interrelations among developmental dimensions.

**PSYC 210. Preparing Research Proposals in Psychology (3)** Seminar, 3 hours; written work, 2 hours. Prerequisite(s): second-year standing or above in the Psychology graduate program or consent of instructor. Designed for advanced graduate psychology students planning a research career. Focuses on funding opportunities for predoctoral research support. Topics include sources of grant support, mechanisms of grant support, and essentials of grant writing. Graded Satisfactory (S) or No Credit (NC).

**PSYC 211. Statistical Inference (4)** Lecture, 3 hours; discussion, 1 hour; laboratory, 2 hours. Prerequisite(s): graduate standing in Psychology or consent of instructor. Examines basic issues related to the application of statistical inference, effect size estimation, and significance tests to various research paradigms in psychology. Discusses aspects of psychological measurement and the appropriateness of particular statistical techniques to different types of psychological data.

**PSYC 212. Multiple Regression and Correlation Analysis (4)** Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour. Prerequisite(s): graduate standing in Psychology, PSYC 211; or consent of instructor. Multiple regression, the general linear model, their relationship to analysis of variance, and extensions to multivariate analysis. The use of assorted computer statistical packages.

**PSYC 213. Experimental Design and Analysis of Variance (4)** Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): graduate standing in Psychology, PSYC 211; or consent of instructor. Experimental design and analysis of variance including repeated measures and mixed designs, with special attention to exploratory data analysis, nested designs, interactions, and contrasts.

**PSYC 225. Theories and Concepts of Social Psychology (3)** Lecture, 3 hours. Prerequisite(s): consent of instructor. Advanced theories and concepts of social psychology. Special attention is given to the history and development of the major concepts of the field. Required of all social-personality graduate students.

**PSYC 226. Theories and Concepts of Personality Psychology (3)** Lecture, 3 hours. Prerequisite(s): consent of instructor. Advanced critical review of the theories, assessment techniques, and empirical literature in personality psychology. Special attention is given to the interactionist perspective. Required of all social-personality graduate students.

**PSYC 227. Research Methods in Social and Personality Psychology (3)** Lecture, 3 hours. Prerequisite(s): consent of instructor. Covers laboratory and field research methods, personality and dependent variable measurement, research design, bias and artifacts, and meta-analysis. Also addresses interview and surveys, focus groups, research publication, and ethics.

**PSYC 231. Mathematical and Computational Models in Cognitive Science (3)** Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the technical and theoretical issues involved in using models to understand behavior. Emphasis is on hands-on analysis of model predictions and simulation of behavioral data. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units if taken with different instructors.

**PSYC 233. Research Methods in Cognitive Science (3)** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Develops skills in research methodologies currently available to cognitive scientists such as eye-tracking, computational modeling, signal detection, neuroimaging, and event-related potential techniques. Emphasis is on critically examining assumptions of methods and current research utilizing each method, and on how each is being utilized to address theoretical and empirical questions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 9 units if taken with different instructors.

**PSYC 234. Data Analysis in Cognitive Sciences (3)** Lecture, 3 hours. Prerequisite(s): graduate standing in Psychology or consent of instructor. Focuses on the analysis of cognitive psychological data obtained using specialized methodologies particularly relevant to cognitive psychology research including computer simulation, online experimentation, and eye tracking. Topics include real-time data analysis, signal detecting theory, Fourier analysis, and reaction time data. Course is repeatable to a maximum of 9 units if taken with different instructors.

**PSYC 243. Multivariate Statistics (3)** Lecture, 3 hours; laboratory, 1 hour. Prerequisite(s): PSYC 211, PSYC 212, PSYC 213. Introduces students to multivariate statistical methods, including multivariate analysis of variance, analysis of covariance, repeated measures analysis of variance, cluster analysis, discriminant function analysis, multivariate regression, principal components analysis, exploratory factor analysis, and confirmatory factor analysis. Focuses on the theoretical and practical applications of each method. Graded Satisfactory (S) or No Credit (NC).

**PSYC 251. Seminar in Cognitive Neuroscience. (3)** Seminar, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Consists of seminars, oral reports, and discussions by students, faculty, and visiting scholars on current trends in cognitive neuroscience. Focuses on a memory phenomenon. Graded

Satisfactory (S) or No Credit (NC). Course is repeatable.

**PSYC 255. Seminar in Social Psychology (3)** Seminar, 3 hours. Prerequisite(s): consent of instructor. Selected advanced topics in social psychology. The contents of these courses will vary. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PSYC 256. Seminar in Perception (3)** Seminar, 3 hours. Prerequisite(s): consent of instructor. Study and discussion of experimental papers in relation to the theory of perceptual processes. Graded Satisfactory (S) or No Credit (NC). May be repeated.

**PSYC 257. Seminar in Personality Psychology (3)** Seminar, 3 hours. Prerequisite(s): consent of instructor. Selected advanced topics in personality with an emphasis on experimental findings and theoretical interpretations. Graded Satisfactory (S) or No Credit (NC). May be repeated.

**PSYC 258. Seminar in Developmental Psychology (3)** Seminar, 3 hours. Prerequisite(s): consent of instructor. Selected advanced topics in developmental psychology. Graded Satisfactory (S) or No Credit (NC). May be repeated.

**PSYC 259. Topics in Quantitative Methods (3)** Lecture, 3 hours. Prerequisite(s): graduate standing in Psychology or consent of instructor. A study of selected advanced topics in quantitative methods specifically for behavioral research, especially multivariate analysis. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change.

**PSYC 262. Developmental Biopsychology (3)** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers basic processes of brain development and plasticity from conception to adulthood. Emphasis is on relationships between biological and psychological phenomena such as sensation, perception, and learning. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade.

**PSYC 263. Seminar in Physiological Psychology (3)** Seminar, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Readings, oral reports, and discussions by students, faculty, and visiting scholars of selected areas in physiological psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 36 units.

**PSYC 270. Current Research in Quantitative Psychology (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Discussion of selected research topics in quantitative psychology. Emphasis on contemporary research design and quantitative problems relevant to the on-going research areas of graduate students and faculty. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

**PSYC 271. Current Issues in Cognition (3)** Seminar, 3 hours. Prerequisite(s): consent of instructor. Current issues in memory, learning, and psycholinguistics. Emphasis is on recent and important experimental findings and on theoretical development. Graded Satisfactory (S) or No Credit (NC). May be repeated.

**PSYC 283. Proseminar on Current Research in Cognitive Psychology (1)** Seminar, 1 hour; written work, 4 hours per quarter; extra reading, 1-3 hours. Prerequisite(s): graduate standing or consent of instructor. Presentations by students, departmental faculty, or visiting scholars describing current research in cognitive psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

**PSYC 284. Proseminar on Current Research in Developmental Psychology (1)** Seminar, 1 hour; written work, 4 hours per quarter; extra reading, 1-3 hours. Prerequisite(s): graduate standing or consent of instructor. Presentations by students, departmental faculty, and visiting scholars describing current research in developmental psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

**PSYC 285. Proseminar on Current Research in Social/Personality Psychology (1)** Seminar, 1 hour; written work, 4 hours per quarter; extra reading, 1-3 hours. Prerequisite(s): graduate standing or consent of instructor. Presentations by students, departmental faculty, and visiting scholars describing current research in social/personality psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

**PSYC 287. Colloquium in Neuroscience (1)** Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Involves oral presentations on current research topics in neuroscience by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with NRSC 287.

**PSYC 289. Special Topics in Neuroscience (2)** Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, BIOL 289, CHEM 289, ENTM 289, and NRSC 289.

**PSYC 290. Directed Studies (1-6)** Prerequisite(s): consent of instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PSYC 291. Individual Study in Coordinated Areas (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for doctoral examinations. Graded Satisfactory (S) or No Credit (NC). May be repeated to a total of 18 units; units do not count toward the Master's Degree.

**PSYC 292. Concurrent Analytical Studies (1-4)** Outside research, 2-8 hours. Prerequisite(s): consent of instructor. Each 292 course will be taken concurrently with some 100-series course, but on an individual basis. It will be devoted to specific additional projects related to the 100-series course. Faculty guidance and evaluation will be provided through the quarter. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**PSYC 296. Research Tutorial (3)** scheduled research, 3 hours; outside research, 3 hours; reading (extra), 3 hours; extra writing, 3 hours. Prerequisite(s): graduate standing in Psychology or consent of instructor. Research performed under the supervision of a faculty advisor. Course is repeatable to a maximum of 18 units.

**PSYC 297. Directed Research (1-6)** Prerequisite(s): consent of instructor. Minor research studies or exploratory work toward the development of the dissertation problem. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PSYC 299. Research for Thesis or Dissertation (1-12)** Prerequisite(s): consent of instructor and department. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**PSYC 301. Teaching Psychology at the College Level (2)** Seminar, 1 hour; practicum, 3 hours. Prerequisite(s): admission to graduate standing in Psychology. Teaching Assistant Development Program offered by the Teaching Assistant Development Office of the Graduate Division. Required prior to or concurrent with the student's first teaching assistant appointment. May be waived by petition based on previous experience. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PSYC 309. Professional Development and Research Ethics (3)** Seminar, 3 hours. Prerequisite(s): graduate standing in Psychology. Designed for advanced graduate students planning a teaching and/or research career in psychology. Covers teaching; conducting research and research ethics; professional ethics; interviewing, writing, and oral presentation skills; the academic job market and the job application process; and nonacademic careers. Graded Satisfactory (S) or No Credit (NC).

## Public Policy

**Subject abbreviation: PBPL**  
**College of Humanities, Arts, and Social Sciences**

Anil Deolalikar, Ph.D., Chair  
Program Office, 2417 Humanities and Social Sciences  
(951) 827-2743

### Committee in Charge

Ken Baerenklau, Ph.D. (Environmental Studies)  
Christopher Chase-Dunn, Ph.D. (Sociology)  
John Cioffi, Ph.D. (Political Science)  
Mary Gauvain, Ph.D. (Psychology)  
Mindy Marks, Ph.D. (Economics)  
Juliet McMullin, Ph.D. (Anthropology)  
Toby Miller, Ph.D. (English/Sociology/  
Women's Studies)  
Kathick Ramakrishnan, Ph.D. (Political Science)  
Robert K. Ream, Ph.D. (Education)  
Ellen Reese, Ph.D. (Sociology)  
Dylan Rodriguez, Ph.D. (Ethnic Studies)  
Georgia Warnke, Ph.D. (Political Science)  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

## Major

Public policy analysis is the use of decision-making theory and evidence-based methods to the study of substantive public policy problems. The objective of public policy analysis is to improve the quality of public policy-making by critically examining the design and relevance of public policies, their implementation and execution, and their impact on households, communities, and the society at large. By its very nature, policy analysis is multidisciplinary. For instance, policies to address health problems in society must draw on developments in philosophy, economics, political science, medicine, and ethics (among other disciplines).

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Public Policy are as follows:

Students will not be admitted into the major until they have completed PBPL 001 with a "C-" grade or better.

- Lower-division requirements (six courses [at least 24 units])
  - PBPL 001
  - POSC 010 or POSC 015
  - ECON 003
  - PHIL 002 or PHIL 003
  - HIST 017B or HIST 020
  - One course chosen from ECON 005, PSYC 011, SOC 005, STAT 040, STAT 048
- Upper-division requirements (10 courses chosen from two tracks, with no more than seven courses from one track.

### Track 1: Health and Population Policy

ANTH 147/WMST 140, ANTH 160, ECON 129, ECON 156, ECON 183, ENSC 141/MCBL 141/SWSC 141, ETST 116/HISA 147, POSC 180, PSYC 178, PSYC 179, SOC 137, WMST 140/ANTH 147

### Track 2: Social, Cultural, and Family Policy

ANTH 109/WMST 109, ANTH 148/WMST 150, ECON 122E, ECON 155/WMST 155, ECON 159, EDUC 114, EDUC 132/POSC 132, ETST 126, ETST 139, ETST 146/EDUC 146, ETST 156, MCS 133/SOC 138, MCS 139/SOC 139, MCS 171/SPN 171, PHIL 168/WMST 141, PHIL 108/WMST 108, POSC 146, PSYC 167/ETST 167, PSYC 168/ETST 168, SOC 120, SOC 122, SOC 130, SOC 138/MCS 133, SOC 139/MCS 139, SOC 143/URST 143, SOC 144, SOC 160, SOC 161, SOC 183 (E-Z), WMST 109/ANTH 109, WMST 150/ANTH 148, WMST 155/ECON 155, WMST 164/ANTH 164/LNST 164

### Track 3: Economic Policy

ECON 132, ECON 135, ECON 117/PHIL 119, ECON 118, ECON 152, ECON 153/BUS 153, ECON 160/BUS 160, ETST 109F, PHIL 116, POSC 164, POSC 182, POSC 186

### Track 4: Urban/Environmental Policy

ECON 121F, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 146/URST 146, ENSC 101, ENSC 141/MCBL 141/SWSC 141, ENSC 143C/ECON 143C, LWSO 175 (E-Z), PHIL 117, POSC 127, POSC 172/URST 172, SOC 182/URST 182, SOC 184

**Track 5: Policy Institutions and Processes**

ANTH 104, ECON 116, ECON 119, HIST 111, HISA 120B, LWSO 100, LWSO 193, PHIL 165, POSC 101, POSC 146, POSC 150, POSC 167, POSC 168, POSC 170, POSC 173, POSC 186, PSYC 175, RLST 174, RLST 175, SOC 150, SOC 151, SOC 159

**Track 6: International and Foreign Policy**

ECON 187/LNST 187, POSC 120, POSC 125, POSC 126, POSC 127, POSC 129, POSC 154, POSC 158/LNST 148, POSC 159, POSC 160, POSC 162/LNST 142, POSC 169, RLST 173/POSC 109, SOC 135, SOC 181

**3. Public Policy Seminar/Colloquia**

During the junior and senior years, students must enroll in PBPL 191 (Seminar in Public Policy), which includes attendance at public lectures to the campus community given by outside speakers — typically policy makers, administrators and researchers — on timely and important policy issues facing the Inland Empire, the state, the nation, and the world.

**4. Domestic or International Policy Practicum**

In the third or fourth year of the program (or during the summer between the third and fourth years), students must undertake a policy practicum (PBPL 198-I), which consists of an internship (paid or voluntary) on a policy issue or problem with a local, state or federal government agency, nonprofit or for-profit organization, a trade association, a labor/trade union, or a public-affairs firm. The Public Policy Program Committee helps students locate internship opportunities. The summer internship provides students with an opportunity to gain real-world experience and apply the analytical skills learned in the classroom. Students enrolled in the UC Riverside Washington Academic Program, the UC Center at Sacramento program or the Education Abroad Program can apply that experience toward the policy practicum requirement, and do not need to undertake a separate internship.

**5. Senior Thesis (for Honors candidates only)**

Students who have an outstanding academic record in their course work during the first three years of the program can become candidates for Honors in Public Policy during the spring quarter of their junior year. All honors candidates must enroll in a two-quarter senior thesis seminar (PBPL 195H) that will culminate in a written thesis covering a real policy problem of the student's choice. The thesis project could grow out of the practicum experience.

**Minor**

1. Lower-division requirements (four courses [at least 16 units])

a) PBPL 001

b) One course from ECON 005, PSYC 011, SOC 005, STAT 040, STAT 048, HIST 017B, HIST 020

c) One course from ECON 003, PHIL 002, PHIL 003, POSC 010, POSC 015

2. Upper-division requirements (six courses [at least 24 units] chosen from two tracks:

**Track 1: Health and Population Policy**

ANTH 147/WMST 140, ANTH 160, ECON 129, ECON 156, ECON 183, ENSC 141/MCBL 141/SWSC 141, ETST 116/HISA 147, POSC 180, PSYC 178, PSYC 179, SOC 137, WMST 140/ANTH 147

**Track 2: Social, Cultural, and Family Policy**

ANTH 109/WMST 109, ANTH 148/WMST 150, ECON 122E, ECON 155/WMST 155, ECON 159, EDUC 114, EDUC 132/POSC 132, ETST 126, ETST 139, ETST 146/EDUC 146, ETST 156, MCS 139/SOC 139,

MCS 171/SPN 171, PHIL 108/WMST 108, PHIL 168/WMST 141, POSC 146, PSYC 167/ETST 167, PSYC 168/ETST 168, SOC 120, SOC 122, SOC 130, SOC 138/MCS 133, SOC 139/MCS 139, SOC 143/URST143, SOC 144, SOC 160, SOC 161, SOC 183 (E-Z), WMST 109/ANTH 109, WMST 150/ANTH 148, WMST 155/ECON 155, WMST 164/ANTH 164/LNST 164

**Track 3: Economic Policy**

ECON 132, ECON 135, ECON 117/ PHIL 119, ECON 118, ECON 152, ECON 153/BUS 153, ECON 160/BUS 160, ETST 109F, PHIL 116, HIST 184, POSC 164, POSC 186

**Track 4: Urban/Environmental Policy**

ECON 121F, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 146/URST 146, ENSC 101, ENSC 141/MCBL 141/SWSC 141, ENSC 143C/ECON 143C, LWSO 175 (E-Z), PHIL 117, POSC 127, POSC 172/URST 172, SOC 184

**Track 5: Policy Institutions and Processes**

ECON 116, ECON 119, ANTH 104, HIST 111, HISA 120B, LWSO 100, LWSO 193, PHIL 165, POSC 101, POSC 146, POSC 150, POSC 166, POSC 167, POSC 168, POSC 170, POSC 173, POSC 186, PSYC 175, RLST 174, RLST 175, SOC 150, SOC 159

**Track 6: International and Foreign Policy**

ECON 187/LNST 187, POSC 120, POSC 125, POSC 126, POSC 127, POSC 129, POSC 154, POSC 155, POSC 158/LNST 148, POSC 159, POSC 160, POSC 169, RLST 173/POSC 109, SOC 135, SOC 181

**3. Public Policy Seminar/Colloquia**

During the junior and senior years, students must enroll in PBPL 191 (Seminar in Public Policy), which includes attendance at public lectures to the campus community by outside speakers — typically policy makers, administrators and researchers — on timely and important policy issues facing the Inland Empire, the state, the nation, and the world.

**Lower-Division Courses****PBPL 001. Introduction to Public Policy Analysis (4)**

Lecture, 3 hours; discussion, 1 hour. Introduces the basic concepts and processes underlying policy analy-

sis, including application of these concepts to economic and budgetary policy, health care policy, welfare and social security policy, education policy, and environmental and energy policy.

**PBPL 090. Special Studies (1-3)** Individual study, 3-9 hours. Prerequisite(s): consent of program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 8 units.

**Upper-Division Courses**

**PBPL 170. Technology, Policy, and Ethics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing. Provides contemporary perspectives on interplays between technology, public policy, and ethics. Covers social, legal, and ethical issues such as liability, as well as environmental, patent, and copyright law. Cross-listed with ENGR 170.

**PBPL 171. Globalization (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): junior standing. Covers technological drivers of globalization. Includes social, economic, and political consequences. Explores the cultural aspects of globalization, including barriers and drivers for economic and cultural interdependence and integration, as well as virtual global organizations. Cross-listed with ENGR 171.

**PBPL 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): consent of program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 15 units.

**PBPL 191. Seminar in Public Policy (2)** Seminar, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Seminars by faculty, invited policy scholars, and policy makers on timely policy issues facing the region, state, nation, and the world, such as economic and budgetary policy, health care policy, welfare and social security policy, education policy, environmental and energy policy, and foreign policy. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**PBPL 195H. Senior Honors Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): senior standing in Public Policy; admission to the University Honors Program or consent of instructor. Students complete research in public policy and write a senior honors thesis under the guidance of a faculty member. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

**PBPL 198-I. Individual Internship in Public Policy (1-12)** Written work, 1-12 hours; internship, 2-24 hours. Prerequisite(s): junior standing in Public Policy; consent of instructor. Internship in a public or quasi-public agency or business concern in matters relating to public policy. Requires a summary paper. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**Religious Studies**

**Subject abbreviation: RLST**

**College of Humanities, Arts, and Social Sciences**

Vivian-Lee Nyitray, Ph.D., Chair  
Department Office, 3033 CHASS  
Interdisciplinary North  
(951) 827-3612; [religiousstudies.ucr.edu](http://religiousstudies.ucr.edu)

**Professors**

Pashaura Singh, Ph.D.  
Ivan A. Strenski, Ph.D. *Holstein Family  
and Community Chair in Religious Studies*

**Professors Emeriti**

Joel W. Martin, Ph.D.  
June E. O'Connor, Ph.D.  
Douglas M. Parrott, Ph.D.  
Brian K. Smith, Ph.D.

**Associate Professors**

Michael Alexander, Ph.D.  
Vivian-Lee Nyitray, Ph.D.

**Assistant Professors**

Muhamad Ali, Ph.D.  
Amanda Huffer, Ph.D.  
Jennifer S. Hughes, Ph.D.  
Sherri Johnson, Ph.D.

**Major**

The Department of Religious Studies provides an opportunity for students to gain a broad, cross-cultural perspective by studying the diverse religious traditions of the world. Students examine the texts, symbols, myths, rituals, ideas, values, and ethical systems of many religious traditions, such as Judaism, Christianity, Islam, Hinduism, Buddhism, Chinese, African, and Native American religions.

Majoring in Religious Studies can be an excellent preparation for living in a multicultural society and for a variety of careers, such as teaching, counseling, business, law, writing, the arts, and professional religious leadership. Religious Studies at UCR develops in students a variety of valuable and transferable skills. These include disciplined attention to the facts (texts, ideas, history, behavior); critical reflection and analysis about claims of meaning and value and about assumptions and methods used in the study of religion; and descriptive and analytical writing about religious history, ideas, motivations, practices, and ethical concerns. A minor in Religious Studies is also available. Students are encouraged to consult with the department chair and other faculty about their questions and interests.

**The Holstein Family and Community Chair in Religious Studies** The Holstein Family and Community Chair in Religious Studies is an endowed faculty chair, the result of a generous contribution given by the Robert and Loretta Holstein family and by friends of the Holstein family and the university. **Dr. Ivan Strenski**, the chair, is a distinguished scholar and teacher whose work engages thought on the interactions of religions and cultures as these are manifested in cultural, social, ethical, and historical debates.

**The Dr. Jasbir Singh Saini Endowed Chair in Sikh and Punjabi Studies** The Dr. Jasbir Singh Saini Endowed Chair in Sikh and Punjabi Studies is the result of a generous contribution given by the Saini Foundation, the Sikh Foundation and by a number of individuals and the University. It honors the memory of the late Dr. Jasbir Singh Saini, who was a cardiologist in Phoenix, Arizona. **Dr. Pashaura Singh** has been appointed to the Chair and is a leading scholar and teacher whose work in the field of Adi Granth studies is internationally acclaimed. For

more information on the Endowed Chair, please visit the following website:

<http://www.religiousstudies.ucr.edu/SPS/index.html>.

**University Requirements**

See Undergraduate Studies section.

**College Requirements**

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

**Major Requirements**

The major requirements for the B.A. degree in Religious Studies are as follows:

1. Lower-division requirements (12 units)
  - a) RLST 005
  - b) RLST 012/ETST 012
  - c) One additional 4-unit course in Religious Studies or equivalent
2. Upper-division requirements (40 units)
  - a) At least two courses from each of the following areas:
    - (1) Eastern religions
    - (2) Western religions
    - (3) Themes in religions
  - b) RLST 100 or RLST 102
  - c) RLST 193 (Senior Seminar)
  - d) Eight (8) additional units from Religious Studies courses (closely related courses from other programs or departments may be substituted upon approval)

The programs of all majors should be developed in consultation with their advisors.

**Art History/Religious Studies Major**

The Art History/Religious Studies Major combines the disciplinary interest in the history of the visual arts with its related religious content and background. Three concentrations are offered. Students must select one family of religions, either Asian or Western, and combine it with the study of the history of the visual arts in the corresponding area of artistic endeavor. Or, students wishing to combine Asian and Western materials to serve a comparative purpose are invited to design their own major in consultation with faculty representatives from both departments. Students are strongly encouraged to participate in the Education Abroad Program and in internships abroad. Students in this major will be well prepared for graduate studies in either art history or religious studies.

**Major Requirements**

The major requirements for the B.A. degree in Art History/Religious Studies are as follows:

- Asian Concentration** (52 units)
1. Lower-division requirements (12 units)
    - a) Art History (4 units): AHS 015
    - b) Asian Studies (4 units):  
AST 030/CHN 030
    - c) Religious Studies (4 units): RLST 005

2. Upper-division requirements (40 units)
  - a) Art History (16 units): AHS 140, AHS 141, AHS 143, CPLT 141
  - b) Religious Studies (24 units) choose from: RLST 101, RLST 103, RLST 105, RLST 106, RLST 142/AST 142/CHN 142, RLST 144/CPLT 144
3. Optional 190 level work in either Art History or Religious Studies

**Student-designed Comparative Concentration** (52 units)

1. Lower-division requirements (12 units)
  - a) Art History, choose at least 4 units: AHS 015, AHS 017A, AHS 017B, AHS 017C, AST 030/CHN 030
  - b) Religious Studies, choose at least 4 units: RLST 005, RLST 007, RLST 010
2. Upper-division requirements (40 units)
  - a) Art History, choose at least 12 units: AHS 140, AHS 141, AHS 143, AHS 155, AHS 156, AHS 157, AHS 159, AHS 161, AHS 162, AHS 164, AHS 171, AHS 172, CPLT 141
  - b) Religious Studies, choose at least 12 units: RLST 100, RLST 101, RLST 103, RLST 105, RLST 106, RLST 111, RLST 121, RLST 128 (E-Z), RLST 130, RLST 131, RLST 135/HISE 130, RLST 136, RLST 142/AST 142/CHN 142, RLST 144/CPLT 144
3. Optional 190 level work in either Art History or Religious Studies

**Western Concentration** (52 units)

1. Lower-division requirements (16 units)
  - a) Art History (12 units): AHS 017A, AHS 017B, AHS 017C
  - b) Religious Studies (4 units) choose from: RLST 007, RLST 010
2. Upper-division requirements (36 units)
  - a) Art History (16 units) choose from: AHS 155, AHS 156, AHS 157, AHS 159, AHS 161, AHS 162, AHS 164, AHS 171, AHS 172
  - b) Religious Studies (20 units) choose from: RLST 100, RLST 111, RLST 121, RLST 128 (E-Z), RLST 130, RLST 131, RLST 135/HISE 130, RLST 136
3. Optional 190 level work in either Art History or Religious Studies

**Minor**

Requirements for a minor in Religious Studies are as follows:

1. Lower-division requirements (12 units)
  - a) RLST 005
  - b) RLST 012/ETST 012
  - c) One additional 4-unit course in Religious Studies
2. Upper-division requirements (16 units)

- a) Twelve (12) units consisting of one course from each of the following three areas:
- (1) Eastern religions
  - (2) Western religions
  - (3) Themes in religions
- b) Four (4) upper-division units from those courses approved for the Religious Studies major

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

The Department of Religious Studies offers the M.A. and Ph.D. degrees in Religious Studies.

The graduate program in Religious Studies is for students interested in the critical academic study of religions. The Ph.D. program prepares students to enter into academia as researchers and university instructors in a specific field of expertise.

**Admission** All applicants must submit GRE General Test scores and transcripts from all previous institutions, along with three letters of academic reference and a Statement of Goals and Qualifications. Applicants whose first language is not English must also take the TOEFL exam.

### Master's Degree

The Department of Religious Studies offers the M.A. in Religious Studies.

The M.A. program allows students to explore the academic study of religions broadly and is for students who wish to expand their study of religions in an academic environment but may not yet wish to pursue a career in academia.

**Admission** Although an undergraduate major in religious studies is not required for admission into the graduate program, applicants should demonstrate significant interest in and background in the academic study of religions and the appropriate scholarly approaches to religious studies. Applicants to the master's pro-

gram must demonstrate scholarly acuity, as well as interest in the critical questions of the discipline of religious studies. Given the broader scope of the master's program, applicants to this degree program do not need to specify a particular field of study they wish to pursue in the program.

**Course work** Candidates must complete a minimum of 36 units for the degree; 18 of the 36 units must be 200-level courses. Twelve units comprise the three core courses required of all graduate students (RLST 200A, RLST 200B, RLST 200C), preferably completed in the first year of study. The remaining units should be from among the religious studies graduate offerings; additional course work in related areas (e.g., history, anthropology, philosophy, comparative literature) are encouraged as time and workload permit. Some entering students may also be encouraged to take graduate-level survey courses in Asian or Western or Native American religious traditions.

**Comprehensive Examinations** In the final quarter of their program, master's students complete a series of comprehensive written examinations that are designed by the department and administered by a master's examination committee. These examinations test the student's knowledge of specific fields of study as well as the areas of critical inquiry that serve as the methodological focus of the program.

**Foreign Language Requirement** Students must demonstrate reading proficiency in either French or German, the languages in which much modern secondary scholarship in the discipline has been written. Students may petition to substitute either another modern language of secondary scholarship or a language or primary research if it is deemed more immediately relevant to their studies. This requirement can be fulfilled through a departmental examination, by passing a designated language course (FREN 009A, FREN 009B, GER 002R), or by alternative certification (such as a diploma from a foreign language institute).

**Normative Time to Degree** 6 quarters.

### Doctoral Degree

The Department of Religious Studies offers the Ph.D. in Religious Studies.

The Ph.D. program prepares students to enter into academia as researchers and university instructors in a specific field of expertise.

**Admission** Although an undergraduate major in religious studies is not required for admission into the graduate program, applicants should demonstrate significant interest in and background in the academic study of religions and the appropriate scholarly approaches to religious studies. In addition, applicants are held to a high standard of undergraduate preparation for their graduate work: both basic and advanced courses in religious studies (in methods and in their chosen field of study), beginning work in foreign languages (particularly if this will be an integral component of their par-

ticular course of study), and a demonstrated ability to work across methods, traditions, and disciplines. A master's degree is not required for admission to the doctoral program.

**Course work** Candidates must complete any two of the following core courses (RLST 200A, RLST 200B, RLST 200C), preferably in their first year of coursework. In addition, students must also complete two Method and Theory courses (RLST 201 and RLST 202), and at least 24 units in a major area of geographic study (either Asian religions or Religions in the West). At least 12 additional units should be taken in a minor area of geographic study (some other aspect of Asian Religions or Religions in the West).

### Written and Oral Qualifying Examinations

Students must complete a round of qualifying written examinations, followed by an oral defense of those examinations, in the quarter following their completion of course work. (Students may defer their examinations for one quarter in consultation with the graduate advisor and faculty.) Students complete the three written examinations over a two- to three-week period in the following areas:

- Major field studies
- Comparative studies
- Critical studies

The Major Field Studies examination evaluates the student's mastery of the chosen field of study (some specific tradition within Asian religions or within Religions in the West), with particular attention to subdivisions of these fields of study on which the student has decided to focus (e.g., Buddhist monasticism or Christian ethics).

The Comparative Studies examination draws on the minor field of study the student has focused on in course work; the student must demonstrate the ability to elucidate aspects of the academic study of religions through the juxtaposition of traditions (e.g., Judaism and Islam).

The Critical Studies examination will have two components: a method section, focusing on some methodological approach to the study of religion (e.g., ethnography or literary studies) and a theory section, focusing on some conceptual approach to religion (e.g., Weber or Durkheim).

The three examinations give students the opportunity to demonstrate an overall mastery of subjects and approaches and prepare them for the more focused, rigorous research work they will pursue in their dissertations.

After completing the written examinations, students undergo an oral examination by committee. The content of the oral examinations is based on the written examination questions and answers.

Both the written and oral examinations are composed, administered, and evaluated by a qualifying committee, nominated by the graduate advisor in consultation with the student and

is appointed by the graduate dean.

Upon the successful completion of the written and oral qualifying examinations, the student is recommended to the graduate dean for advancement to candidacy.

**Foreign Language Requirement** Students must demonstrate reading proficiency in either French or German, the languages in which much modern secondary scholarship in the discipline has been written. Students may petition to substitute either another modern language of secondary scholarship or a language of primary research if it is deemed more immediately relevant to their studies. This requirement can be fulfilled through a departmental examination, by passing a designated language course (FREN 009A, FREN 009B, GER 002R), or by alternative certification (such as a diploma from a foreign language institute),

In addition, students must demonstrate proficiency in any language or languages deemed critical for examination of primary texts in their declared field of study (e.g., Japanese, Latin, Arabic, Tagalog, Indonesian). It is strongly suggested that doctoral students begin studying relevant languages for research before beginning their course work at UCR. Adequate language training is becoming increasingly vital in the scholarly and professional training of academics in the fields of religious studies. Many research languages are offered at UCR; if necessary, the faculty will work with students to help place them in needed language courses at other institutions.

**Dissertation and Final Oral Examination** Students prepare a dissertation presented as prescribed by the Graduate Division under the direction of the candidate's dissertation committee. After completion of the dissertation, the candidate is examined by the dissertation committee. This examination normally takes the form of a public presentation by the candidate followed by questions from the committee.

**Normative Time to Degree** 18 quarters.

## Lower-Division Courses

### **RLST 002. Introduction to Comparative Scripture (4)**

Lecture, 3 hours; discussion, 1 hour. Examines sacred texts of several religious traditions in comparative perspective. Contextualizes readings in primary texts from traditions including Zoroastrianism, Judaism, Christianity, Islam, Hinduism, Buddhism, Taoism, classical Confucianism, and a number of modern new religious movements.

**RLST 005. Introduction to Asian Religions (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of the major Asian religions such as Hinduism, Buddhism, Confucianism, Taoism, and Shinto, with particular emphasis on thought structures, practices, and ethics. Readings in the basic texts of the traditions. Credit is awarded for only one of RLST 005 or RLST 005H.

**RLST 005H. Honors Introduction to Asian Religions (4)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University

Honors Program or consent of instructor. Honors course corresponding to RLST 005. A survey of the major Asian religious traditions such as Hinduism, Buddhism, Confucianism, Taoism, and Shinto, with particular emphasis on thought structures, practices, and ethics. Readings in basic texts of the traditions. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of RLST 005 or RLST 005H.

### **RLST 007. Introduction to Western Religions (5)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. An introductory survey of Judaism, Christianity, and Islam. Emphasizes distinguishing characteristics, major ceremonies, foundational texts, and historical interactions. Credit is awarded for only one of RLST 007, RLST 007H, or RLST 007W.

### **RLST 007H. Honors Introduction to Western Religions (5)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to RLST 007 and RLST 007W. An introductory survey of Judaism, Christianity and Islam. Emphasizes distinguishing characteristics, major ceremonies, foundation texts, and historical interactions. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of RLST 007, RLST 007H, or RLST 007W.

### **RLST 007W. Introduction to Western Religions (5)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): ENGL 001B with a grade of "C" or better or consent of instructor. A writing-intensive introductory survey of Judaism, Christianity, and Islam. Emphasizes distinguishing characteristics, major ceremonies, foundational texts, and historical interactions. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better. Credit is awarded for only one of RLST 007, RLST 007H, or RLST 007W.

**RLST 008. Christian Heresies (4)** Lecture, 3 hours; discussion, 1 hour. An introduction to religious controversies from the early Church through the Reformation. Explores the historical context as well as the political, social and cultural impact of diverse religious philosophies and movements within the Christian tradition.

### **RLST 009. Introduction to Latin American Religions (4)**

Lecture, 3 hours; discussion, 1 hour. An introduction to religious practices, beliefs, and movements in Latin America from conquest to present. Topics include indigenous religions and legacy, the impact of mission, evangelization, conversion, Virgin of Guadalupe devotion, Afro-Latin traditions in Cuba and Brazil, the growth of Pentecostal churches, and transnational religion.

**RLST 010. Introduction to the Bible (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. A preparation for informed study of the Bible. Examines contemporary interpretive stances, history, methods, and major themes through the study of significant portions of the Bible.

**RLST 012. Religious Myths and Rituals (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; and images of transcendence. Examines religious beliefs and expressions from diverse cultural perspectives. Utilizes materials from indigenous Native (North and South) American, African American, and/or Asian American religions. Cross-listed with ETST 012. Credit is awarded for only one of ETST 012/RLST 012, ETST

012H/RLST 012H, ETST 012W/RLST 012W, or ETST 012X/RLST 012X.

### **RLST 012H. Honors Religious Myths and Rituals (4)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ETST 012/RLST 012. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; images of transcendence; and understanding religious beliefs and expressions from diverse cultural perspectives. Utilizes source materials from indigenous Native (North and South) American, African American, and/or Asian American religions. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with ETST 012H. Credit is awarded for only one of ETST 012/RLST 012, ETST 012H/RLST 012H, ETST 012W/RLST 012W, or ETST 012X/RLST 012X.

### **RLST 012W. Religious Myths and Rituals (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): a grade of "C" or better in ENGL 001B or consent of instructor. A writing-intensive introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; and images of transcendence. Examines religious beliefs and expressions from diverse cultural perspectives. Utilizes materials from indigenous Native (North and South) American, African American, and/or Asian American religions. This course fulfills the third quarter writing requirement for students who earn a grade of "C" or better. Cross-listed with ETST 012W. Credit is awarded for only one of ETST 012/RLST 012, ETST 012H/RLST 012H, ETST 012W/RLST 012W, or ETST 012X/RLST 012X.

### **RLST 012X. Religious Myths and Rituals (4)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors Program, a grade of "C" or better in ENGL 001B; or consent of instructor. Honors course corresponding to ETST 012W/RLST 012W. A writing-intensive introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; images of transcendence; and understanding religious beliefs and expressions from diverse cultural perspectives. Utilizes materials from indigenous Native (North and South) American, African American, and/or Asian American religions. This course fulfills the third quarter writing requirement for students who earn a grade of "C" or better. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with ETST 012X. Credit is awarded for only one of ETST 012/RLST 012, ETST 012H/RLST 012H, ETST 012W/RLST 012W, or ETST 012X/RLST 012X.

### **RLST 013. World Religions in California (5)**

Lecture, 3 hours; discussion, 1 hour; field, 3 hours. Prerequisite(s): none. Explores the religious landscape of California, providing basic background to texts, beliefs, and practices. Topics include local expressions of Buddhism, Christianity, Hinduism, and Native American religious traditions, as well as spiritual movements specific to the state such as Scientology, Heaven's Gate, Muir's nature mysticism, and Jim Jones's Peoples' Temple.

### **RLST 014. Religion and Science (5)**

Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Covers major themes in the relation of science and religion. Primary focus is on issues between science and Western religions, with attention to Islam, Buddhism, and Hinduism. Major attention is given to creationism and Darwinian evolution. Explores religious meaning in a scientific cosmos through the study of contemporary science fiction and film.

**RLST 015. Death (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Investigates the psychological aspects of facing death and dealing with dying persons; cross-cultural religious and philosophical interpretations of death (as new life, resurrection, rebirth, etc.); and medical, ethical, and legal issues such as physician-assisted suicide and euthanasia. Credit is awarded for only one of RLST 015 or RLST 015H.

**RLST 015H. Honors Death (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to RLST 015. An examination of three sets of issues pertaining to death and dying: psychological and experiential aspects of facing medical crisis, illness, death, and grief; cross-cultural perspectives on the ways in which death is conceived in selected religions of the world with respect to life and claims about afterlife; public policy issues that involve ethical, legal, and medical concerns regarding euthanasia, physician-assisted suicide, and hospice alternatives. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of RLST 015 or RLST 015H.

**RLST 024. Introduction to Native American Culture and Religion (4)** Lecture, 3 hours; discussion, 1 hour. Interdisciplinary study of contemporary and historic Native American efforts to resist colonialism, with a strong emphasis on land matters, identity issues, and religious forms. Promotes critical reflection on historic and contemporary culture and politics. Cross-listed with HIST 034.

**RLST 030. Religion and the City (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): none. Explores how diverse urban landscapes constitute and have been constituted by religious architecture, ritual, schools, activism, monuments, and social ethics. Draws specific examples from Boston, Istanbul, Los Angeles, Benares, Venice, Bangkok, and Beijing.

**RLST 039. Introduction to African American Religions (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introduction to religious practices, beliefs, and movements of African Americans from the seventeenth century to the present. Topics include black religions in North America under slavery, black churches, Black Muslims, Jewish and Spiritualist congregations, and the civil rights movement. Considers the relation of African American religion to literature and music.

**RLST 044. Gods, Ghosts, and Grandparents (4)** Lecture, 3 hours; discussion, 1 hour. Considers some of the different ways the Chinese regarded—and still regard—gods, ghosts, and ancestors. Nearly all the readings are primary sources spanning almost four thousand years of Chinese history and include texts on oracle bones, philosophical arguments for and against the existence of spirits, tomb contracts for the dead, a sutra promoting the goddess Guanyin as Giver of Sons, ghost stories, and eyewitness accounts of funeral rituals. Cross-listed with HIST 044.

## Upper-Division Courses

**RLST 100. The Problem of Religion (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Survey of critics and defenders of religion who debate meanings and functions of religion in light of modern challenges. Topics include religious pluralism due to cross-cultural encounters in Africa, Asia, and the Americas; wars among religions; theories of evolution; discovery of the unconscious; rise of behavioral and social sciences.

**RLST 101. Religions of India (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one lower-division course in Religious Studies or consent of instructor. An examination of the major religious traditions in India with special emphasis on Hinduism and Buddhism.

**RLST 102. Contemporary Themes in Religion and Theory (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of contemporary cultural issues which pose challenges to the nature of religion and the way it is studied in the public university. Issues discussed include race, gender, power, colonialism, and religious commitment.

**RLST 103. Confucian Traditions (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AST 030/CHN 030 or RLST 005 or RLST 005H or upper-division standing or consent of instructor. A study of Confucian thought and practice. Special attention is given to the classical cultivation of virtue and ritual practice, the historical spread of the tradition beyond China, and contemporary issues such as gender and human rights.

**RLST 104. Sikhism (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the social and religious evolution of Sikhism over the past five centuries, tracing its formation in North India to traditions beyond the Indian subcontinent; examines the teachings of Guru Nanak and major doctrinal developments under subsequent Gurus.

**RLST 105. Religions of Japan (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one lower-division course in Religious Studies or consent of instructor. An examination of the major religious traditions in Japan with special emphasis on Shinto and Japanese Buddhism.

**RLST 106. Buddhism (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Aspects of the history and development of Buddhism in its major forms (Theravada, Mahayana, and Vajrayana). Studies of principal sutras, biographies, ethical treatises, birth narratives, and poetry.

**RLST 107. Taoist Traditions (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AST 030/CHN 030 or upper-division standing or consent of instructor. A survey of the ancient mystical and philosophical aspects of Taoism as well as the living religious tradition, their relationships to each other, and their expression in Chinese culture and civilization. Topics include the Tao Te Ching, the *Chuang-tzu*, the Taoist Canon, meditation, immortality, alchemy, and ritual. Cross-listed with AST 107 and CHN 107.

**RLST 108. Modern Hinduism (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of developments in the Hindu religious tradition during the nineteenth and twentieth centuries, inside and outside of India. Topics covered include the impact of colonialism and nationalism on Hinduism, the rise of neo-Hindu movements, modern Hindu “fundamentalism,” and Hinduism in the modern Western world.

**RLST 109. New Religious Movements (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the contexts in which new religions emerge, their relations with dominant religious traditions or normative cultures, and the religious content of such movements. Examines the “cult” versus “religion” debate; apocalyptic, eschatological, and millennial

views of the world; the nature of charismatic leadership; regional patterns; and transnational trends.

**RLST 111. Islam (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of Islam from the time of Muhammad (d. 632 A.D.) to the present. Attention is given to its distinctive beliefs and practices, its influence upon societies in which it became dominant, and its interaction with other traditions.

**RLST 112. Islam in America (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores historical and contemporary dimensions of Islam in America and the way in which Islam shapes and is shaped by American politics and cultures. Introduces analytical tools for understanding Islam and contemporary ideas and practices, including conversion, migration and diaspora, knowledge production, ritual, identity politics, ethics, education, gender, and media.

**RLST 113. Topics in Modern Islam (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines key issues facing Islam in the modern world such as Islam’s engagement with and reaction to nationalism, feminism, the status of sacred texts in the face of critical historical and philological studies, science, and technology.

**RLST 116. Religion and Violence (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the capacity of religion to mobilize and legitimate violence. Materials covered include theoretical texts by Rene Girard, Walter Burkert, Jonathan Z. Smith, and others, and case studies dealing with religion and violence in India, Northern Ireland, Egypt, Lebanon, Israel, Palestine, Sri Lanka, and the United States.

**RLST 117. Mythology (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religions viewed from a variety of theoretical perspectives. Includes material drawn from epics, religious texts, divine hymns, creation myths, heroic legends, and concepts of the afterlife as reflected in literary and nonliterary sources. Cross-listed with CLA 112 and CPLT 112.

**RLST 118. The Problem of Evil: Understanding Evil and Its Manifestations (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the ways that Western culture and religion have defined evil. Primarily investigates religious discourses, but also considers philosophical, social scientific, and popular ideas of evil. Examines evil from the perspectives of the victim, the perpetrator, and the voyeur, and in a variety of media such as fiction, nonfiction, and film.

**RLST 119. Gift and Sacrifice (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis and survey of major theories of sacrifice in relation to the idea of sacrifice as a species of gift. Draws materials from major religious traditions with both ancient and modern applications.

**RLST 121. The Hebrew Bible/Old Testament (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the collection of books usually called the Old Testament by Christians and the Bible by Jews (the acronym T’N’C’H is often used by Jews as well). The books are examined in their historical, cultural, and religious contexts, with attention to the methods of modern literary criticism.

**RLST 124 (E-Z). Studies in Judaism from 70 C.E. to Modern Period (4)** For hours and prerequisites, see segment descriptions. Exploration of developments in Judaism during this period, such as the collection of the Mishna, the development of the Talmud, Jewish Gnosticism, the medieval philosophers, Hassidism, the Reform, Orthodox and Conservative movements.

**RLST 124G. Modern Jewish Thought: Classical Sources and Modern Influences (4)** Lecture, 3 hours; consultation/reading, 1 hour. Prerequisite(s): none. Major modern thinkers including Buber, Rosenzweig, Kaplan, and Heschel among others will be studied in light of their inspirations from the Talmudic, philosophical, and mystical literatures of the Jewish past and in response to the impact of Christian and secular thought of the present.

**RLST 124J. The Essentials of Judaism (4)** Lecture, 3 hours; outside reading, 3 hours, or consultation, 1 hour. An exploration of major teaching of Judaism. A brief historical background is related to central affirmations. Emphasis is placed on the historical shape of faith and contemporary dynamics of faith.

**RLST 124K. Zionism and Holocaust (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): one lower-division course in Religious Studies or consent of instructor. A survey of the religious, historical and ideological background regarding the origins of the Zionist idea and Holocaust.

**RLST 126. Israel: The Jewish State (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines Zionism and the state of Israel in the period from the first Zionist Congress in 1896 to the present. Addresses religious, social, economic, and political aspects of the Jewish state. Cross-listed with HIST 127.

**RLST 127. The Holocaust (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the extermination of European Jewry during World War II. Surveys the history of the "Jewish Question"; Jewish-Christian relations; race; the systematic persecution and genocide of the Jews; and world responses to genocide. Addresses religious, philosophical, and political implications of the Holocaust, as well as continuing anti-Semitic trends. Cross-listed with HISE 147.

**RLST 128 (E-Z). Topics in the Bible (4)** For hours and prerequisites, see segment descriptions. Academic examination of issues relating to the Bible.

**RLST 128E. Contemporary Views of Jesus (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of contemporary ways in which Jesus has been understood by academically oriented scholarship. Particular attention is given to the question of sources and of the methods used to identify those parts of the preserved tradition that are attributed to Jesus himself.

**RLST 128F. Biblical Fictions (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): RLST 010; upper-division standing or consent of instructor. Examines artistic rewritings of biblical narratives from antiquity to the present (ancient Jewish and Christian novels, medieval plays and stories, modern films and novels) to explore the intersections of religion, culture, and society.

**RLST 130. The Bible: New Testament (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the literature and history of the early Christian movement. Attention is given to New Testament materials and apocryphal writings.

**RLST 131. Jesus (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A quest for the historical Jesus, using the methods of modern scholarship, and including a review of those who have dealt with the topic from Reimarus (eighteenth century) to the present.

**RLST 132. Black Exodus: The Great Migration and Religious Imagination (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the history of the Great Migration (approximately 1910-1950) and the spiritual, occupational, and cultural diversification that ensued. Explores the impact of dislocation and urbanization on black religious and artistic production. Topics include the religious marketplace; Exodus theme, Stranger and Home; impact of commercial culture on identity; and class and culture intersections among migrants.

**RLST 133. Christian Origins (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the social, religious, and cultural development of Christianity in its first six centuries. Particular attention paid to issues of heresy/orthodoxy, material piety, and the rise of ecclesiastical institutions.

**RLST 134. Christian Martyrs, Monastics, and Mystics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores avenues to holiness in the Christian tradition. Course materials include sources written by and about religious men and women, both as records documenting their lives and as devotional and instructional texts for others.

**RLST 135A. History of Christianity: Origins to the Reformation (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Surveys the history of Christianity from its origins through the Reformation. Includes the development of Christian beliefs, practices, and institutions in historical contexts. Cross-listed with HIST 130A.

**RLST 135B. History of Christianity: Modern Era (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Surveys the history of Christianity since 1500. Emphasizes the Christianization of Asia, Africa, and the Americas in the long colonial era. Follows developments in Christian belief, practice, and institutions up to the present. Topics include Reformation, mission, colonialism, empire, conversion, syncretism, modernity, Vatican II, and the rise of evangelical Christianity. Cross-listed with HIST 130B.

**RLST 136. Augustine and Aquinas (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examination of selected writings by and about Augustine of Hippo (354-450) and Thomas Aquinas (1226-1274), whose works have had a major impact on Western religions, literature, and history. Themes addressed include the search for wisdom, the nature of happiness, what constitutes a good life, the nature of freedom and the source of evil, the existence of God, the relationships between faith and reason, the power and limits of language.

**RLST 137A. Religious Cultures in Early America (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 017A is recommended. An introduction to religious beliefs and practices during the seventeenth and eighteenth centuries in the colonies that became the United States. Cross-listed with HISA 122A.

**RLST 137B. Religious Cultures in Modern America (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s):

upper-division standing or consent of instructor; HIST 017B is recommended. An introduction to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with HISA 122B.

**RLST 138. Colonialism and Religions in Mexico (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers the survival, revival, and invention of religious traditions in ancient and contemporary Mesoamerica. Examines indigenous and immigrant religions through themes such as myths and rituals of pre-Columbian peoples; sexuality and eroticism in religion; Indian theology and theogony; Counter Reformation Catholicism; and growing religious syncretisms. Cross-listed with LNST 138.

**RLST 140. Martin, Malcolm, and Masculinity (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the religious thought of the two most notable black religious figures of the twentieth century. Addresses the ways notions of gender lay deeply embedded within their faith, public persona, and conceptions of black freedom. Topics include black theology of liberation, masculinist rhetoric, and black feminist and womanist responses.

**RLST 142. Chuang-tzu (4)** Lecture, 1 hour; discussion, 2 hours; outside research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): RLST 005 or RLST 005H or AST 107/CHN 107/RLST 107 or consent of instructor. An examination of chaos, epistemological and linguistic relativism, fate, skill, and the character of the sage in perhaps the most significant of Chinese Taoist texts, the *Chuang-tzu*. Discussion of the structure and style of this literary masterpiece. Students with knowledge of classical Chinese may arrange additional work through special studies. Cross-listed with AST 142 and CHN 142.

**RLST 144. Buddhist Literature (4)** Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Readings in canonical and non-canonical Buddhist texts. Includes Buddhist-influenced literature written by Asian, European, and American authors. Examines themes of emptiness, impermanence, and no-self. Cross-listed with AST 133 and CPLT 144.

**RLST 145. Buddhism in Southeast Asia (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): RLST 106 or consent of instructor. Explores various texts, magical practices, forms of meditation, rituals, and beliefs of ancient and modern Buddhism, focusing on the ways in which they are transformed by nuns, monks, and the laity in Burma, Cambodia, Laos, Thailand, and California. Cross-listed with SEAS 145.

**RLST 149. Southeast Asian Religions (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Introduces aspects of religion in various Southeast Asian countries, including Indonesia, Malaysia, Thailand, Cambodia, Vietnam, and the Philippines, through contextualized readings featuring historical, anthropological, literary, and other disciplinary perspectives on this diverse region.

**RLST 150. Islam in Southeast Asia (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the religious, intellectual, and cultural history of Muslim Southeast Asia, including Indonesia, Malaysia, Brunei, as well as minority communities in Singapore, Thailand, Cambodia, and the southern Philippines. Examines a series of contextualized read-

ings in translated primary sources. Approaches texts from historical, anthropological, literary, and other disciplinary perspectives.

**RLST 151. Reading the Qur'an (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the Qur'an, Islam's primary scripture. Examines the contexts in which the text originated. Offers critical analyses of the Qur'an and discussion of its roles in the cultural histories of Muslim societies.

**RLST 155. Peace in the Middle East (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the roots of the Middle Eastern crises. Focuses on the Arab-Israeli conflict and possible solutions toward peace. Addresses problems through historical, religious, and political lines of inquiry. Cross-listed with PHIL 155.

**RLST 156. Jews and Arabs (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with ARLC 156, CPLT 156, and MEIS 156.

**RLST 157. Introduction to Arabic Literature (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic literature that focuses on language and rhetoric. Considers major issues such as colonialism, secularism, modernity, language, and the state. Utilizes texts from literature, the law, and philosophy. Cross-listed with ARLC 155, CPLT 155, and MEIS 155.

**RLST 158. Islam and Psychoanalysis (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores contemporary psychoanalytic readings of Islam to consider the relationship between Islam and Orientalism, Orientalism and psychoanalysis, and psychoanalysis and Islam. Cross-listed with ARLC 158, CPLT 158, and MEIS 158.

**RLST 160. Women and Religion (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): consent of the instructor. Examination of attitudes toward and images of women in diverse religious traditions, including such issues as the presence and absence of women in leadership roles, women's spiritual experience, female founders of religious groups, and recent developments in feminist religious thought. Cross-listed with WMST 160.

**RLST 162. Women's Issues in Modern Muslim Thought (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Introduces complex religious and social issues related to the role of women in modern Islamic societies ranging from North America to Southeast Asia through an examination of Muslim writings produced during the past century. Cross-listed with WMST 162.

**RLST 163. The Women of Early Christianity (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the social roles and literary constructs of early Christian women as evidenced in the New Testament, patristic, and Apocryphal writings. Also considers the significance of those textual traditions for later Western ideas about women's social roles, including traditional and feminist theories. Cross-listed with WMST 163.

**RLST 164. Native American Religions (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines scholarly approaches to the study of Native American religions and important dimensions of the religious traditions of diverse Native American communities (Muskogees, Koyukon, Lakotas, Apaches, and others). Themes addressed include responses to historical change, ecological worldviews, moral systems, and the arts.

**RLST 166. Evangelical Religion, Media, and Culture in America (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the history of the use of media technologies among evangelicals. Addresses the interconnections between religious productions of meaning, proselytization, and politics. Explores the ways the critical interlace of religion and media both shapes and is shaped by the ways participants understand themselves as racial, gendered and classed subjects.

**RLST 167. Religion and Film (4)** Lecture, 3 hours; scheduled screening, 2 hours; outside screening, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the intersections of film, religious meaning, and contemporary society.

**RLST 168. Religion and Art: Image, Icon, Idol (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the use of sacred images in spiritual practice in diverse religious traditions and explores the visual representation of the divine in different cultural contexts. Places special emphasis on Christian and Hindu traditions but also seeks to understand why some religions reject the use of images altogether.

**RLST 169. Religion and Music (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the complex intersection of sound, religion, religious experience, and culture. Explores how sacred music and varieties of sound-induced or sound-enhanced religious experience enables groups of people to construct religious meaning and understand their world. Focuses on musical forms of practices and embodied experiences of the sacred.

**RLST 170. Current Issues in Religious Ethics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one lower-division course in Religious Studies or consent of instructor. Consideration of the ethical dimension in contemporary religious and social issues (for example, war, sexuality, sexism, racism, hunger, ecology, medical ethics). Historical and contemporary religious thought will provide resources for critical reflection on these areas of decision-making.

**RLST 173. Political Religions and Religious Politics (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigation of major themes and issues in the intersection of religion and politics, such as the sacralization of politics, religious nationalisms, sacral kingship, revolutionary asceticism, "throne and altar," civil religion, millennialism, political myth and ritual, integralism, and the conformity of the polity to religious values. Cross-listed with POSC 109.

**RLST 174. The Power of Nonviolence (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural exploration of the traditions of nonviolent change as fundamental worldviews and lifestyles, as strategic alternatives to war and socioeconomic oppression, and as practical forms of interpersonal and social conflict resolution.

**RLST 175. Religion and Human Rights (4)** Lecture, 3 hours; independent research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of selected human rights struggles with particular attention given to the role of religion. Case examples are taken from North and Latin America, South Africa, South Asia, or China, among others.

**RLST 176. Peace and War (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of peace and war from diverse religious and ethical perspectives. Addresses nuclear and conventional war and revolutionary wars of liberation as ethical issues requiring social policy and personal decision. Topics include "just war," "holy war," nonviolence, and pacifism.

**RLST 178. Religious Biography (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the construction and continuing appropriation of biographical images (textual and visual narratives) in selected religious traditions. Special attention is given to problems of intertextuality and the medium of presentation in the communication of "religious" meaning. Cross-listed with CPLT 178.

**RLST 179. Pilgrimage (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of pilgrimage in religious traditions (Judaism, Christianity, Islam, Buddhism, Hinduism) from sociological, anthropological, and ritual perspectives, considering constructions of time, space, community, and ethnicity. Attention is paid to the concept of colonialism and the formation of an "American" religious identity through sacred space and travel.

**RLST 180. Saints and Gurus (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how religious virtuosos have shaped religious practice and the teaching of Hinduism, Buddhism, Jainism, Sikhism, and Islam in South Asia. Examines history, myth, poetry, meditation, yoga, and ritual, with a focus on how the ascetic ideal has shaped global imagination about South Asia.

**RLST 184. Contemporary Christian Theologies (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of contemporary Christian theologies and schools of thought in the context of history and society. In addition to selected thinkers, the following movements are studied: orthodoxy; neoorthodoxy; Christian existentialism; evangelical, ecumenical, secular, process, liberation, and feminist theologies.

**RLST 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): consent of instructor and department chair. To be taken to meet special curricular problems. Course is repeatable to a maximum of 16 units.

**RLST 193. Senior Seminar (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of major religious documents from world religions. Choice of texts, traditions, and key unifying themes vary each year but typically focus on fundamental religious issues such as worldliness or otherworldliness, belief or unbelief, observance or nonobservance, commitment and disaffiliation, attachment or non-attachment, and conversion or rejection.

**RLST 195. Senior Thesis (1-4)** Enrollment by request of student with the approval of the Program faculty, which must be granted no later than the quarter

before the course is to be taken. May be taken for four units only in the first or second quarter of the senior year; two more units may be taken in a subsequent quarter. Total credit may not exceed 6 units.

**RLST 197. Research for Undergraduates (1-2)** individual research, 3-6 hours. Prerequisite(s): upper-division standing or consent of instructor. Directed individual research. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 4 units.

**RLST 198-I. Individual Internship (1-6)** Internship, 2-12 hours; reading and writing, 1-6 hours. Prerequisite(s): upper-division standing or consent of instructor; consent of department chair. An individually designed, academically grounded internship that provides an opportunity for advanced majors to apply their knowledge of religion to businesses and organizations outside the university. Prior approval of the instructor and supervisor is required for units, fieldwork, and academic content. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

## Graduate Courses

**RLST 200A. Religion, Politics, and Public Discourse (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of graduate advisor is required for students repeating the course. Critical examination of the intersections of religious identities and public politics. Topics vary by instructor but might include human rights, "church-state" debates, Islamism, civil religion, and postcolonial religions. Course is repeatable to a maximum of 8 units if taken with different instructors.

**RLST 200B. Representations, Interpretations, and Critical Histories (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of graduate advisor is required for students repeating the course. A critical examination of how religious identity and religious studies have shaped and been shaped by modes of representation, interpretation, and historical awareness. Specific topics of analysis vary according to instructor but might include biographies, art and architecture, mass media, and scriptural interpretation. Course is repeatable to a maximum of 8 units if taken with different instructors.

**RLST 200C. Religions in Contact (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of graduate advisor is required for students repeating the course. A critical examination of how religions confront each other historically, politically, and metaphorically. Specific topics vary according to instructor but might include syncretism, mission and colonization, religious wars, ecumenism, and "world religion" movements. Course is repeatable to a maximum of 8 units if taken with different instructors.

**RLST 201. Thinking about Religion: Classic Theories in the Study of Religion (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A critical study of classic theories and theorists in the study of religion within their historical contexts. Featured thinkers include Frazer, Eliade, Smart, Spinoza, Durkheim, Freud, and Weber. Considers such intellectual movements as Higher Criticism of the Bible, psychoanalysis, phenomenology, and hermeneutics. May be taken Satisfactory (S)

or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 202. Contemporary Theories and Theorists in the Study of Religion (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of graduate advisor is required for students repeating the course. A critical consideration of leading contemporary theories and theorists in religious studies. Selection of theories and theorists changes according to the interests of the instructor. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 16 units if taken with different instructors.

**RLST 210. Understanding Theories of Religion (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the technique and theory of interpreting theoretical texts of the study of religion within historical contexts. Special attention is paid to Charles Taylor's theory of interpretation in the human sciences and Quentin Skinner's theory of understanding theoretical ideas. Models are drawn from the literature of the theory of myth, religion, and sacrifice. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 212. The Durkheimian Tradition in the Study of Religion (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers major figures and themes in the Durkheimian approach to the study of religion. Pays special attention to qualitative methods of analysis. Focuses on the Durkheimian development of major religious themes: gift, magic, religion, sacred time and space, and sacrifice. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 220. Advanced Topics in Method and Theory in the Study of Religion (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An inquiry into the major conceptual issues of the methods and theories employed in the study of religion. Topic varies from quarter to quarter. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 221. The Religious Studies-Theology Debate (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Addresses current debates concerning the relation of theologies to humanistic studies of religion. Covers neoorthodox, liberal, post-liberal and postmodern theologies as alternatives to varieties of the humanistic study of religion in the public university. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 222. Human Rights as a Moral Discourse (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Inquiry into the moral and ethical dimensions of philosophical, religious, legal, and historical traditions of "rights-talk." Attention paid to conceptual, historical, cross-cultural, and case-study source materials. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 224. Comparative Religious Ethics (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Inquiry into a variety of debates about ethics: religious and philosophical, theoretical and applied. Topics may include policy debates about bioethics, moral inquiries into virtue, ethics and minority discourse, violence and nonviolence as means of social change, or fundamental moral problems generated by suffering. May be

taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 227. Politics and Religion: From Premodern to Postmodern (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the relation between politics and religion from premodernity through postmodernity. Topics include the divine right of kings; Machiavelli, Locke, and Hobbes; documents of the American, English, French, and Turkish revolutions; Islamism; secularism; the clash of civilizations; the United States as a Christian nation; and fascism and nationalism as religions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 228. Lived Religions and Local Faiths: Cultural Approaches to the Study of Religion (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers ethnographic, anthropological, and other cultural approaches to the study of religion. Traces emergence of the cultural study of religion from colonial encounters to current-day ethnographies of religion. Evaluates risks and promises of ethnography for the study of religion. Includes ethnographic project. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 229. Material Culture of Religion (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines how material objects complicate oral and textual statements about religious belief and practice. Considers the material dimensions of scripture, ritual objects, and everyday artifacts associated with religion; the agency of objects; and religion and consumer culture. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 230. Theory and Writing on Native American Religious Traditions (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Theoretical study of Native American religious history, including its research, interpretation, and writing, in relation to colonialism and tribal sovereignty. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 234. Popular and Elite Religion (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores complexity within religious traditions. Analyzes scholarly categories of classification such as popular and elite, sectarian and diffuse, or clerical and lay. Examines methods for the study of popular religion despite scarcity of evidence compared with official sources. Emphasizes content relevant to the expertise of the instructor. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 235. Christian Hagiography (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Study of the writing of Christian saints' lives from a cultural perspective. Explores the role of holy men and women in premodern Christianity, with special focus on sanctity, materiality, social formations, and the relation between text and reality. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 236. Gender and Religion (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the role of sex and gender in selected religious beliefs and practices. Topics include gender and divinity; conceptions of the body; femininity and masculinity; marriage; sexuality; and sexual renunciation. May be

taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 237. Asceticism (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an analysis of the theories and practices associated with bodily renunciation, focused especially on the first Christian centuries. Explores issues such as fasting, sexual abstinence, and social withdrawal from a variety of critical perspectives, with special attention paid to gender, status, and the body in religion. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 238. Religious Images (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the use of sacred images in spiritual practice in diverse religious traditions. Examines various methods for the study of religious images, as well as the philosophical, theoretical, and theological issues that arise. Includes issues related to representation, perception/vision, materiality, the power of symbol, and related museographic and curatorial issues. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 239. Ethics and Politics in African American Religious Life (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the competing ethical and political orientations of representative religious traditions in the African American community. Uses tools of social/critical theory to dissect various religious formations and movements in terms of social formations, ruling ideas, and economic forces of the dominant culture. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 240. Advanced Topics in the Study of North American Religion (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores major issues in recent scholarship in North American religion. Topics include debates over emerging theories such as narrative and market model approaches; secularism; immigration, race, and ethnicity; religion and national identity formation; religious imagination in regards to border and boundary crossing; and the role of Protestant privilege. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 241. From Text to Scripture: Canon, Performance, Reception (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focusing on the Sikh sacred text as a primary example, investigates the intellectual and emotional factors underlying the composition, copying, canonization, and transmission of sacred texts, with attention to issues of production and reception in historical communities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 245. Via Mystica (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines religious virtuosi in Islam, Christianity, Hinduism and Buddhism, including Puu Mi Bun, sufis, swamis, saints, and martyrs. Uncovers the close connection between these religions in terms of ritual technology, soteriological goals, meditative practices, and eschatological articulations. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 246. Religious Reading Cultures (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines textual communities and interpretative virtuosi in different religious cultures. Explores the means by which

religious scripture is composed, transmitted, translated, illuminated, performed, and preserved in Christianity, Judaism, Buddhism, Hinduism, and Islam. Introduces students to the methodologies and approaches of textual anthropology, intertextuality, homiletics, liturgical studies, performance theory, and philology. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 249. Public Religious Discourses in Modern Islam (4)** Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the complexities of contemporary Islam as lived by Muslims in local and global contexts by examining the content and dynamics of modern discussions of religious and social issues in Muslim "public spheres." Involves primary and secondary sources of information.. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 250. Approaches to Islam in Religious Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines various approaches to the study of Islam. Includes textual, ritual-symbolical, historical, anthropological, sociological, and cultural studies. Also explores orientalism and occidentalism, textuality and orality, sacredness and profanity, orthodoxy and heterodoxy, tradition and modernity, conversion, identity, and media. Utilizes primary works on Islamic scriptures, ritual, and societies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 252. Southeast Asian Islam (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to contextualized readings in translated primary source texts in the fourteenth through the twenty-first centuries from Muslim Southeast Asia. Explores the richness of Islamic culture in the region through discussions of broader issues of Islam, Muslim societies, and the academic study of religion. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 261. Problems in the Study of Buddhism (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines controversies in the field of Buddhist studies. Topics include the rise of asceticism in India, the composition of the earliest Buddhist texts, the process of transmission of texts and translation problems, the rise of sectarian debate, and women's role in Buddhist ecclesia. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 263. Historiography of Sikh Hermeneutics (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the historiography of Sikh hermeneutics, focusing on the historical contexts of various schools of interpretations of the Adi Granth in premodern, modern, and postmodern periods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 270. Topics in Jewish Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines current problems in the field of Jewish studies. Topics address issues related to memory, identity, economy, power, gender, race, genetics, and culture. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 271. The Nietzschean Tradition in the Study of Religion (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent

of instructor. Studies major themes and thinkers of the Nietzschean approach to and analysis of religion. Focuses on power, epistemology, phenomenology, metaphysics, role playing, and the genealogy of morals. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 272. Jews and the Economy (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys facts and fictions about Jews and the economy. Topics include usury, the court Jew, finance, retail and manufacturing, labor movements, organized crime, and culture industries. Addresses select issues of culture and economy, as well as depictions of Jewish money in literature, film, and journalism. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**RLST 290. Directed Studies (1-5)** Outside research, 3-15 hours. Prerequisite(s): consent of instructor and graduate advisor. Advanced work in a topic or topics appropriate to the student's special interests and needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**RLST 291. Individual Study in Coordinated Areas (1-12)** Individual study, 3-36 hours. Prerequisite(s): consent of instructor; doctoral standing. Program of study designed to advise and assist candidates who are preparing for qualifying examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**RLST 292. Concurrent Studies in Religious Studies (1-4)** Outside research, 3-12 hours. Prerequisite(s): consent of instructor; concurrent enrollment in a RLST-100 level course. Taken concurrently with a 100-level RLST course, but on an individual basis. Devoted to completion of a graduate paper based on research related to the 100-level course. Faculty guidance and evaluation is provided throughout the quarter. RLST 190, RLST 193, RLST 195, RLST 197, and RLST 198-I may not be used for this course arrangement. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**RLST 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): consent of instructor; graduate standing. Individualized research under the sponsorship of specific faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**RLST 299. Research for the Dissertation (1-12)** Outside research, 3-36 hours. Prerequisite(s): satisfactory completion of the Ph.D. qualifying examination. Research, under the direction of a faculty member, for preparation of the thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**RLST 302. Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): appointment as a Teaching Assistant; graduate standing. Supervised teaching in lower- and upper-division Religious Studies courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Related Courses

**ANTH 124. Ritual and Religion. (4)** Description under Anthropology.

**AHS 155. Cultures in Conflict: Art at the Fall of the Roman Empire. (4)** Description under Art History.

**AHS 156. Memory of Empire: the Art of Early Medieval Europe.** (4) Description under Art History.

**CLA 165. Greco-Roman Cults and Credence.** (4) Description under Classics.

**ENGL 100E. Scriptures, Myths, Interpretation.** (4) Description under English.

**HISE 132. The Reformation.** (4) Description under History.

**PHIL 159. Philosophy of Religion.** (4) Description under Philosophy.

**SOC 158. The Sociology of Religion.** (4) Description under Sociology.

## Sociology

**Subject abbreviation: SOC**

**College of Humanities, Arts, and Social Sciences**

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Steven G. Brint, Ph.D.  
Peter J. Burke, Ph.D.  
Christopher Chase-Dunn, Ph.D.  
Robert A. Hanneman, Ph.D.  
Augustine J. Kposowa, Ph.D.  
Alexandra Maryanski, Ph.D.  
Alfredo M. Mirandé, Ph.D.  
(Sociology/Ethnic Studies)  
Robert Nash Parker, Ph.D.  
Raymond L. Russell, III, Ph.D.  
Jan E. Stets, Ph.D.  
David A. Swanson, Ph.D.  
Austin T. Turk, Ph.D.  
Jonathan H. Turner, Ph.D., *University Professor*  
Kirk R. Williams, Ph.D.

### Professors Emeriti

Edna M. Bonacich, Ph.D. (Ethnic Studies/Sociology)  
Edgar W. Butler, Ph.D.  
Scott L. Coltrane, Ph.D.  
Jane R. Mercer, Ph.D.  
Linda Brewster Stearns, Ph.D.

### Associate Professors

Scott N. Brooks, Ph.D.  
Karen D. Pyke, Ph.D.  
Ellen Reese, Ph.D.

### Assistant Professor

Vanesa Estrada-Correa, Ph.D.  
Katja Guenther, Ph.D.  
Matthew Mahutga, Ph.D.  
Tanya Nieri, Ph.D.

## Majors

Sociology is the scientific study of human behavior, interaction and organization. It provides a historical and comparative perspective on human societies and offers a framework for understanding society and the complex social world.

Students majoring in sociology can choose between a B.A. or B.S. degree. The department also offers majors in Sociology/Administrative Studies, and Sociology/Law and Society; as well as a minor in sociology. All students must meet quarterly prior to course enrollment with the student affairs officer or the undergraduate advisor to develop a program of studies.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

### Sociology Major

The major requirements for the B.A. and B.S. degrees in Sociology are as follows:

#### For the Bachelor of Arts

**Sociology Department requirements** (14 courses [at least 56 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. Lower-division requirements (5 courses [at least 20 units])
  - a) SOC 001 or SOC 001H with a grade of "C" or better
  - b) SOC 004, SOC 005 with a grade of "C" or better in each
  - c) Two additional lower-division Sociology courses with a grade of "C" or better in each
2. Upper-division requirements (9 courses [at least 36 units])
  - a) SOC 168 or SOC 169
  - b) A minimum of one course each selected from four of the following seven areas of emphasis:
    - (1) Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/ BUS 176
    - (2) Social Psychology: SOC 173, SOC 174, SOC 175, SOC 177G, SOC 178
    - (3) Social Inequality: SOC 129, SOC 130, SOC 133, SOC 135
    - (4) Urban Sociology: SOC 137, SOC 143/URST 143, SOC 182/URST 182, SOC 184
    - (5) Criminology and Deviance: SOC 144, SOC 147, SOC 149, SOC 159, SOC 180
    - (6) Social Institutions and Change: SOC 120, SOC 122, SOC 123, SOC 139/MCS 139, SOC 158, SOC 160, SOC 179, SOC 181
    - (7) Family and Gender: SOC 140, SOC 141, SOC 142, SOC 153
  - c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

- c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

#### For the Bachelor of Science

**Sociology Department requirements** (16 courses [at least 64 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. Lower-division requirements (5 courses [at least 20 units])
  - a) SOC 001 or SOC 001H with a grade of "C" or better
  - b) SOC 004, SOC 005 with a grade of "C" or better in each
  - c) Two additional lower-division Sociology courses with a grade of "C" or better in each
2. Upper-division requirements (11 courses [at least 44 units])
  - a) SOC 110, SOC 168, SOC 169
  - b) A minimum of one course each selected from four of the following seven areas of emphasis:
    - (1) Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/ BUS 176
    - (2) Social Psychology: SOC 173, SOC 174, SOC 175, SOC 177G, SOC 178
    - (3) Social Inequality: SOC 129, SOC 130, SOC 133, SOC 135
    - (4) Urban Sociology: SOC 137, SOC 143/URST 143, SOC 182/URST 182, SOC 184
    - (5) Criminology and Deviance: SOC 144, SOC 147, SOC 149, SOC 159, SOC 180
    - (6) Social Institutions and Change: SOC 120, SOC 122, SOC 123, SOC 139/MCS 139, SOC 158, SOC 160, SOC 179, SOC 181
    - (7) Family and Gender: SOC 140, SOC 141, SOC 142, SOC 153
  - c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

### Sociology/Administrative Studies Major

The major requirements for the B.A. and B.S. degree in Sociology/Administrative Studies are as follows:

#### For the Bachelor of Arts

**Sociology Department requirements** (14 courses [at least 56 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. Lower-division requirements (5 courses [at least 20 units])
  - a) SOC 001 or SOC 001H with a grade of "C" or better
  - b) SOC 004, SOC 005 with a grade of "C" or better in each

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- c) Two additional lower-division Sociology courses with a grade of "C" or better in each
2. Upper-division requirements (9 courses [at least 36 units])
- a) SOC 168 or SOC 169
- b) A minimum of one course each selected from four of the following seven areas of emphasis:
- (1) Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/  
BUS 176
  - (2) Social Psychology: SOC 173, SOC 174, SOC 175, SOC 177G, SOC 178
  - (3) Social Inequality: SOC 129, SOC 130, SOC 133, SOC 135
  - (4) Urban Sociology: SOC 137, SOC 143/URST 143, SOC 182/URST 182, SOC 184
  - (5) Criminology and Deviance: SOC 144, SOC 147, SOC 149, SOC 159, SOC 180
  - (6) Social Institutions and Change: SOC 120, SOC 122, SOC 123, SOC 139/MCS 139, SOC 158, SOC 160, SOC 179, SOC 181
  - (7) Family and Gender: SOC 140, SOC 141, SOC 142, SOC 153
- c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

### Administrative Studies requirements (37 units)

1. Lower-division courses (17 units)
  - a) BUS 010, BUS 020
  - b) STAT 048 or equivalent (may be used to satisfy breadth requirements)
  - c) CS 008 (may be used to satisfy breadth requirements)
2. Upper-division requirements (20 units)
  - a) Two courses (8 units) from the list below:
    - (1) ECON 102 or ECON 104A or ECON 130 or BUS 162/ECON 162
    - (2) PSYC 140 or PSYC 142
    - (3) SOC 150 or SOC 151 or SOC 171
    - (4) POSC 181 or POSC 182 or POSC 183
    - (5) ANTH 127 or ANTH 131These two courses must be outside the discipline of Sociology and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.
  - b) A three-course track (12 units) in Business Administration courses from one of the following:
    - (1) Organizations (General): ANTH 105/BUS 158, BUS 100, BUS 107, BUS 176/SOC 176, SOC 150, SOC 151

- BUS 176/SOC 176, SOC 150, SOC 151
- (2) Human Resources Management/  
Labor Relations: BUS 100, BUS 107, BUS 153/ECON 153, BUS 155, BUS 157, ECON 152, PSYC 142
  - (3) Business and Society: BUS 100, BUS 102, BUS 107, PHIL 116, POSC 182, POSC 186
  - (4) Marketing: BUS 103, and two from BUS 112, BUS 113, BUS 114, BUS 117
  - (5) Managerial Accounting/Taxation: BUS 108, and two from BUS 166, BUS 168A, BUS 168B
  - (6) Financial Accounting: BUS 108, BUS 165A, BUS 165B
  - (7) Finance: BUS 106/ECON 134 and two from BUS 134, BUS 136, BUS 137, BUS 138, BUS 139
  - (8) Management Information Systems: BUS 101, BUS 171, BUS 173
  - (9) Production Management: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

**Note** In filling the dual requirements of the selected major, students may not count more than two courses toward both parts of their total requirements (Sociology requirements and Administrative Studies requirements).

### For the Bachelor of Science

#### Sociology Department requirements (16 courses [at least 64 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. Lower-division requirements (5 courses [at least 20 units])
  - a) SOC 001 or SOC 001H with a grade of "C" or better
  - b) SOC 004, SOC 005 with a grade of "C" or better in each
  - c) Two additional lower-division Sociology courses with a grade of "C" or better in each
2. Upper-division requirements (11 courses [at least 44 units])
  - a) SOC 110, SOC 168, SOC 169
  - b) A minimum of one course each selected from four of the following seven areas of emphasis:
    - (1) Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/  
BUS 176
    - (2) Social Psychology: SOC 173, SOC 174, SOC 175, SOC 177G, SOC 178
    - (3) Social Inequality: SOC 129, SOC 130,

- SOC 133, SOC 135
- (4) Urban Sociology: SOC 137, SOC 143/URST 143, SOC 182/URST 182, SOC 184
  - (5) Criminology and Deviance: SOC 144, SOC 147, SOC 149, SOC 159, SOC 180
  - (6) Social Institutions and Change: SOC 120, SOC 122, SOC 123, SOC 139/MCS 139, SOC 158, SOC 160, SOC 179, SOC 181
  - (7) Family and Gender: SOC 140, SOC 141, SOC 142, SOC 153
- c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

#### Administrative Studies requirements (37 units)

1. Lower-division courses (17 units)
  - a) BUS 010, BUS 020
  - b) STAT 048 or equivalent (may be used to satisfy breadth requirements)
  - c) CS 008 (may be used to satisfy breadth requirements)
2. Upper-division requirements (20 units)
  - a) Two courses (8 units) from the list below:
    - (1) ECON 102 or ECON 104A or ECON 130 or BUS 162/ECON 162
    - (2) PSYC 140 or PSYC 142
    - (3) SOC 150 or SOC 151 or SOC 171
    - (4) POSC 181 or POSC 182 or POSC 183
    - (5) ANTH 127 or ANTH 131These two courses must be outside the discipline of Sociology and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.
  - b) A three-course track (12 units) in Business Administration courses from one of the following:
    - (1) Organizations (General): ANTH 105/BUS 158, BUS 100, BUS 107, BUS 176/SOC 176, SOC 150, SOC 151
    - (2) Human Resources Management/  
Labor Relations: BUS 100, BUS 107, BUS 153/ECON 153, BUS 155, BUS 157, ECON 152, PSYC 142
    - (3) Business and Society: BUS 100, BUS 102, BUS 107, PHIL 116, POSC 182, POSC 186
    - (4) Marketing: BUS 103, and two from BUS 112, BUS 113, BUS 114, BUS 117
    - (5) Managerial Accounting/Taxation: BUS 108, and two from BUS 166, BUS 168A, BUS 168B
    - (6) Financial Accounting: BUS 108,

BUS 165A, BUS 165B

- (7) Finance: BUS 106/ECON 134 and two from BUS 134, BUS 136, BUS 137, BUS 138, BUS 139
- (8) Management Information Systems: BUS 101, BUS 171, BUS 173
- (9) Production Management: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

**Note** In filling the dual requirements of the selected major, students may not count more than two courses toward both parts of their total requirements (Sociology requirements and Administrative Studies requirements).

### Sociology/Law and Society Major

The major requirements for the B.A. and B.S. degrees in Sociology/Law and Society are as follows:

#### For the Bachelor of Arts

**Sociology Department requirements** (14 courses [at least 56 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. Lower-division requirements (5 courses [at least 20 units])
  - a) SOC 001 or SOC 001H with a grade of "C" or better
  - b) SOC 004, SOC 005 with a grade of "C" or better in each
  - c) Two additional lower-division Sociology courses with a grade of "C" or better in each
2. Upper-division requirements (9 courses [at least 36 units])
  - a) SOC 168 or SOC 169
  - b) A minimum of one course each selected from four of the following seven areas of emphasis:
    - (1) Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/ BUS 176
    - (2) Social Psychology: SOC 173, SOC 174, SOC 175, SOC 177G, SOC 178
    - (3) Social Inequality: SOC 129, SOC 130, SOC 133, SOC 135
    - (4) Urban Sociology: SOC 137, SOC 143/URST 143, SOC 182/URST 182, SOC 184

(5) Criminology and Deviance: SOC 144, SOC 147, SOC 149, SOC 159, SOC 180

(6) Social Institutions and Change: SOC 120, SOC 122, SOC 123, SOC 139/MCS 139, SOC 158, SOC 160, SOC 179, SOC 181

(7) Family and Gender: SOC 140, SOC 141, SOC 142, SOC 153

- c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

**Law and Society requirements** (36 units)

- a) PHIL 007 or PHIL 007H
- b) LWSO 100
- c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
- d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159.
- e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180.
- f) LWSO 193, Senior Seminar

**Note** For sections d) and e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Sociology requirements and Law and Society requirements).

#### For the Bachelor of Science

**Sociology Department requirements** (16 courses [at least 64 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. Lower-division requirements (5 courses [at least 20 units])
  - a) SOC 001 or SOC 001H with a grade of "C" or better
  - b) SOC 004, SOC 005 with a grade of "C" or better in each
  - c) Two additional lower-division Sociology courses with a grade of "C" or better in each
2. Upper-division requirements (11 courses [at least 44 units])
  - a) SOC 110, SOC 168, SOC 169
  - b) A minimum of one course each selected from four of the following seven areas of emphasis:
    - (1) Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/ BUS 176

(2) Social Psychology: SOC 173, SOC 174, SOC 175, SOC 177G, SOC 178

(3) Social Inequality: SOC 129, SOC 130, SOC 133, SOC 135

(4) Urban Sociology: SOC 137, SOC 143/URST 143, SOC 182/URST 182, SOC 184

(5) Criminology and Deviance: SOC 144, SOC 147, SOC 149, SOC 159, SOC 180

(6) Social Institutions and Change: SOC 120, SOC 122, SOC 123, SOC 139/MCS 139, SOC 158, SOC 160, SOC 179, SOC 181

(7) Family and Gender: SOC 140, SOC 141, SOC 142, SOC 153

- c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

**Law and Society requirements** (36 units)

- a) PHIL 007 or PHIL 007H
- b) LWSO 100
- c) One course chosen from ECON 111, POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
- d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159.
- e) Two courses chosen from ENSC 174, HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180.

6. LWSO 193, Senior Seminar

**Note** For sections d) and e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Sociology requirements and Law and Society requirements).

#### Minor

The requirements for the minor in Sociology are as follows:

1. SOC 001, SOC 004, SOC 005
2. Sixteen (16) upper-division units from
  - a) SOC 168 or SOC 169
  - b) Any three additional upper-division courses in Sociology with no more than 4 units in any combination of SOC 190, SOC 197, SOC 198-I

There can be no substitution for the courses listed without prior departmental approval.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Sociology Undergraduate Honors Program

Students who meet the departmental requirements for academic excellence are invited at the end of their junior year to participate in the Sociology Undergraduate Honors Program during their senior year. The students enroll in SOC 195 to work on an honors thesis under the supervision of a faculty member, for a total of 12 units distributed over three quarters. Students in the program also participate in SOC 199H, a year-long seminar led by the chair of Undergraduate Affairs Committee, for which they receive a total of 3 additional units of credit.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer or undergraduate advisor for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

The Department of Sociology offers the M.A. and Ph.D. degrees in Sociology. The graduate program in Sociology is designed to prepare students for teaching and research careers in the discipline of sociology. The graduate program is designed as a full-time course of study for students seeking the Ph.D. degree. The M.A. degree in Sociology is awarded as part of a student's required progress toward admittance into the Ph.D. program in Sociology. The Department of Sociology does not award an M.A. degree to a student who already received an M.A. degree in Sociology from another institution.

## Doctoral Degree

**Admission** Admission into the graduate program is based on the following criteria:

1. Prior academic performance, especially in undergraduate or graduate Sociology classes
2. Performance on the GRE
3. Letters of reference from persons familiar with an applicant's potential for achieving academic excellence
4. The extent to which an applicant's areas of expressed interest coincide with teaching and research emphases in the department

Applicants to the graduate program in Sociology are encouraged to submit a copy of a pro-

fessional or term paper with their application for consideration in the admissions process. In general, students are admitted for the fall quarter of each academic year. Applicants to the graduate program for mid-year admissions are not recommended because the sequence of core courses is designed to begin with the fall quarter. The deadline for an application for admission for the fall quarter is May 1 and January 5 for various university fellowship programs. Applicants who lack adequate undergraduate preparation in sociology must make up such deficiencies before work can be credited toward the graduate program. A detailed statement of degree requirements and procedures for the graduate degree is available at [sociology.ucr.edu/academic/graduate.html](http://sociology.ucr.edu/academic/graduate.html). General university requirements of the Graduate Division are at [www.graduate.ucr.edu](http://www.graduate.ucr.edu) and in the Graduate Studies section of this catalog.

The graduate program is designed to allow students to proceed through three distinct stages in their pursuit of the Ph.D. degree: the basic core program, the period of specialization, and writing the dissertation.

**Basic Core Program** All students must complete the basic core program, regardless of whether they hold a baccalaureate or master's degree at the time of admission. A student is expected to complete the basic core program in not less than three and not more than six academic quarters. The chair of the graduate affairs committee advises students about the core program.

### Course Requirements

1. In the core program, the minimum requirement is 40 units of academic work with no grade less than a "B". Work in the basic core courses must be distributed as follows:
    - a) Core sequence in theory: SOC 202A, SOC 202B
    - b) Core sequence in methodology: SOC 201A, SOC 201B
    - c) Core sequence in statistics: SOC 203A, SOC 203B
    - d) Proseminar in Sociology: SOC 232
- Note** Under normal circumstances, the core sequences in theory, methodology, and statistics, and the proseminar are to be completed within the first year.
- e) Research colloquium: SOC 293 (required each quarter until student is advanced to candidacy)
  - f) Research practicum: SOC 250
  - g) A minimum of one course from each of two specialization areas

**Note** Students who have had extensive graduate training in a core course area at another graduate school may petition the graduate affairs committee to be examined by a special faculty committee for possible exemption from that core requirement.

**Examination Paper and Oral Examination** Each student must complete a paper that serves as

the comprehensive examination for completion of the master's degree. This paper reflects the student's areas of theoretical and substantive interest since entrance into the program, and it is written in a form, content, and style appropriate for publication or presentation to a sociological audience. A three-person faculty committee oversees the evaluation of the paper and an oral examination of the student. The paper must be completed by the fall quarter of the student's third year in the program. On the basis of a favorable recommendation from the three-person faculty committee, the faculty votes to recommend the awarding of the M.A. degree in Sociology. If the M.A. is awarded or if the student already has an M.A. in Sociology, the faculty then votes on whether the student should continue in the Ph.D. program. If a student is allowed to continue in the Ph.D. program, the faculty then votes on whether to accept the two areas of specialization in which the student requests to be examined.

**Period of Specialization** After admission to the period of specialization, students are expected to consult with faculty who constitute the membership of each standing specialization committee. Under the faculty's guidance, a student is expected to work out a program of graduate seminars, directed reading courses, and research experiences that prepare the student for examination in the chosen two areas of specialization. The primary areas of specialization offered in the department are as follows:

1. Criminology and Sociological Studies
2. Evolutionary Sociology
3. Family and Social Psychology
4. Gender Studies
5. Organizations and Institutions
6. Political Economy and Global Social Change
7. Race and Class Inequality
8. Sociological Theory

A student's program must include at least one academic quarter of supervised research experience through enrollment in SOC 297 and/or by working as a research assistant. Also required is the equivalent of at least one academic quarter of classroom teaching experience at the college level. A student must complete three courses in each of the two specialization areas with a grade of "B" or better in each course.

### Examination Sequence

1. Standing committees composed of faculty in each area administer the written qualifying examinations in the student's two areas of specialization. A student must complete written examinations in each of the two areas of specialization before the end of the fourth year of graduate study.
2. Upon completion of 1) the two written area examinations, 2) the selection of a dissertation committee approved by the graduate advisor, and 3) a dissertation proposal, the student must complete and pass an oral

examination covering the areas of specialization and the dissertation proposal. The oral examination is conducted by a committee of at least five faculty members, including 1) at least one faculty member from each of the two specialization areas, 2) three members of the student's dissertation committee (who may also represent the areas of specialization), and 3) one "outside member" from another department representing the faculty as a whole.

Before advancement to candidacy is approved, a student must successfully complete a minimum of eight courses: three in each of the two specialization areas and one in each of two other specialization areas, with a minimum grade of "B" in each of the courses.

Students who pass the oral examination and all course requirements are advanced to candidacy for the Ph.D. degree.

**Dissertation and Final Oral Examination** The dissertation is normally completed within one year after advancement to candidacy. After the dissertation is prepared according to the rules and format of the Graduate Division and signed and approved by a student's dissertation committee, an oral defense of the dissertation is held. The defense may be waived in exceptional circumstances.

## Lower-Division Courses

**SOC 001. Introduction to Sociology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the basic concepts and theories relating to the study of humans as participants in group life, analysis of culture, social institutions, personality development, and processes of social interaction. Credit is only awarded for one of SOC 001 or SOC 001H.

**SOC 001H. Honors Introduction to Sociology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to SOC 001. An in-depth look at concepts and theories relating to the study of humans as participants in group life, analysis of culture, social institutions, personality development, and processes of social interaction. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of SOC 001 or SOC 001H.

**SOC 004. Methods of Sociological Inquiry (5)** Lecture, 3 hours; discussion, 1 hour; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Applies the fundamentals of science to social research. Investigates problems of research design, sampling, measurement of social phenomena, conduct of field studies, and interpretation of qualitative and quantitative social data.

**SOC 005. Statistical Analysis (5)** Lecture, 3 hours; discussion, 1 hour; outside research, 3 hours. Prerequisite(s): SOC 004. Covers logical and procedural aspects of the application of statistical methods for data reduction and hypothesis testing in sociology. Includes distributions, tabulations, central tendency, variability, independence, contrasts, correlation and regression, and nonparametrics.

**SOC 006. Introduction to Social Science Data Processing (5)** Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): SOC 004. Covers principles of the design of data objects and

structures commonly used in social science research. Includes consideration of coding of qualitative and quantitative data, index and scale construction, data object design (documentation, identification, storage structure), and use of common scientific software.

**SOC 010. The City: An Introduction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introductory exploration of urban processes. Subjects examined include definition, form, structure, and growth of urban regions as seen from the viewpoints of various disciplines. Cross-listed with URST 010.

**SOC 011. Introduction to Applied Demography (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. Introduces the fundamentals of applied demography, including terminology, materials, and analytic tools.

**SOC 015. Social Problems (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. The application of major sociological theories, concepts, and perspectives in an analytical approach to the study of social problems in contemporary society.

**SOC 018. Introduction to Global Change and Inequality (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Introduces basic concepts and perspectives in the macro-comparative study of social change and inequality at the global level. Explores causes and consequences of globalization in the arenas of economy, polity, and culture. Emphasizes their impacts upon various forms of inequality worldwide.

**SOC 020. American Society (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Examines the culture and structure of American society. Topics include beliefs, key institutions, community patterns, and systems of inequality.

**SOC 021. Technology, Society, and Culture (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. Examines the co-evolution of material technology, society, and culture in societies up to the post-industrial era. Explores processes of innovation and diffusion of innovations, as well as anticipated and unanticipated consequences of technology for society and culture.

**SOC 028. Introduction to the Sociology of Gender (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces gender as a system of inequality that organizes social life and shapes the distribution of resources, power, and privilege in ways that benefit men over women, including the social construction of gender in everyday life and the gendering of organizations and institutions such as the workplace.

**SOC 030. Identity and Society (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): none. Studies the nature of the self, one's identities, and their role in social behavior. Examines the processes of self-verification, self-esteem, self-efficacy, and authenticity using social psychological theories. Introduces research methods that allow the study of self and identity processes.

**SOC 031. Couples and Families (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines the major trends in marriage, families, and intimate relationships. Focuses on how inequality and diversity affect loving and family relations. Discusses the dynamics of gender inequality among families and couples and how family life is shaped by race and ethnicity, social class, divorce, and sexuality.

**SOC 035. Racial and Ethnic Issues in American Society (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces issues and topics

associated with racial and ethnic populations in U.S. society. Focuses on social processes that stratify American society by ethnicity and race.

**SOC 036. Inequality in American Society (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Examines inequality in modern American society and how gender, race, and ethnicity, and social class maintain inequality.

**SOC 040. Introduction to Criminology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Analyzes the nature and patterning of criminality, with attention to theoretical and methodological issues encountered in research. Examines explanations and crime control policies regarding linkages among social conflicts and inequalities, criminal laws and enforcement practices, and social deviance.

**SOC 041. Juvenile Delinquency (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Analyzes the nature of delinquency and juvenile justice in American society. Emphasis is on divergent models for administering justice, including pre-court stages, intake procedures, custody treatment, detention and release, adjudication, disposition, and post-adjudicatory supervision, including institutionalization.

## Upper-Division Courses

**SOC 110. Multivariate Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 005. Involves computer analysis of social and behavioral data using statistical inference, multiple-regression, simulation, and multivariate nonparametric techniques.

**SOC 111. Computational Modeling and Simulation (4)** Lecture, 2 hours; workshop, 1 hour; outside research, 3 hours. Prerequisite(s): an introductory course in the social sciences. Introduces computational modeling and simulation methods for theory development. Examines "systems," "complexity," and "dynamics" ideas as they are applied in sciences. Explores models of processes that are applied across all social science disciplines, including aggregation, diffusion, influence, segregation, phase-transition, and bargaining/exchange. Covers the basics of building "agent-based" and "systems-dynamics" computational models.

**SOC 112. Sociology of the Labor Movement (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Introduces sociological literature related to the labor movement. Provides a comparative and historical overview of research on unions, workers' centers, and other organizational forms and collective actions through which working-class people have sought to improve their working and living conditions.

**SOC 120. Human Social Institutions (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. A comparative analysis of the historical and evolutionary development of basic human institutions, including economy, kinship, religion, polity, law, education, medicine, and science. Emphasis is on the historical emergence and differentiation of institutions, and on the dynamic interconnections among institutions in contemporary societies.

**SOC 121. Sociology of the 1960s (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. A sociological approach to the economic, political, and cultural events of the 1960s. Analyzes the impact of such phenomena as civil rights, popular culture, theology, and political participation. Discusses the present-day legacy, including personal histories of former activists.

## 422 / Programs and Courses

**SOC 122. Social Change (5)** Lecture, 3 hours; outside research, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. A study of patterns of social change, resistance to change, and change-producing processes and agencies.

**SOC 123. Human Societies (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or SOC 001 or SOC 001H. Analyzes the emergence and development of human societies from hunters and gathers to horticultural, agrarian, and industrial forms of social organization. Explores social networks, societal change, the transition from food collecting to food producing, early Germanic societies, the rise of the West, and the causes of the Industrial Revolution.

**SOC 125. Evolutionary Sociology (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the objectives and scope of a cross-section of approaches that use evolutionary reasoning to examine such topics as social evolution, human evolution, our primate heritage, neurobiology, and human nature.

**SOC 126. Primate Societies (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. A survey of primate societies from a sociological perspective. Topics include hunting and gathering societies, evolutionary theory, primate origins, the sexual relationships of primates and primate social networks. Network theory and cladistic analysis are used to better understand human evolution and human nature.

**SOC 128. Chicano Sociology (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the experience of Mexicans in U.S. society; history as a minority; mass immigration in the twentieth century, relationships with American institutions, present socioeconomic status, variations in social status from region to region, political emergence and variations in values, social relations and integration with non-Mexicans. Cross-listed with ETST 128.

**SOC 129. Racism in Western Society (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. An analysis of the origins, character, maintenance, and consequences of racism in Western society with an emphasis on the United States.

**SOC 130. Race and Ethnic Relations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H; enrollment priority is given to Sociology majors, Sociology/Administrative Studies majors, and Sociology/Law and Society majors. A study of under-represented racial and ethnic groups. Involves a comparative analysis of the dynamics and consequences of discrimination of racial and ethnic groups in the United States.

**SOC 131 (E-Z). Selected Ethnic Groups (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. In-depth studies of particular ethnic groups in the United States. Treats a specific ethnic group for an entire quarter: F. Black Americans; H. Jewish Americans.

**SOC 132. Field Research on Internalized Racism (4)** Lecture, 3 hours; field, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; ETST 128/SOC 128 or SOC 129 or SOC 130 or a segment of SOC 131 (E-Z) or SOC 133 or SOC 136. Studies the dynamics of internalized racism among people and communities of color, using advanced research methods and data analysis.

**SOC 133. Inequality and Social Class (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Covers the analysis of theory and research concerning sources of inequality in the distri-

bution of scarce rewards in societies; the influence of aspects of social class; and processes involving the hierarchical allocation of social groups to positions.

**SOC 134. Law, Race, Class, Gender, and Culture (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. An introduction to law, jurisprudence, and legal reasoning focusing on the roles that race, class, gender, culture, and language play in law and jurisprudence. Includes an overview of the development of modern American legal thought and various schools of jurisprudence such as legal realism. Discusses modern challenges to legal formalism by critical legal studies, critical race theory, and feminist jurisprudence. Analyzes the equal protection doctrine and recent legal attacks on affirmative action and immigrants.

**SOC 135. Conflict (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Analysis of the sources of social conflict, especially class conflict. Studies social movements arising out of such conflicts, which attempt to bring about fundamental social change.

**SOC 136. Asian Americans (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the two waves of Asian immigration: the late nineteenth- and early twentieth-century immigrations from China, Japan, and the Philippines, and the post-1965 "new immigration" from Southeast Asia, Korea, and other parts of Asia. Considers the causes of immigration, the adaptation of Asians to the United States, and the reaction of society to their presence.

**SOC 137. Population (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Introduction to the study of human populations, including theories, concepts, and measures. The social causes and consequences of population trends. Emphasis on population problems, including population growth, fertility, migration, and mortality.

**SOC 138. The Effects of Mass Media (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. A sociological approach to "media effects" including the history of effects research, theories, loci of effects studies, and social policy. Cross-listed with MCS 133.

**SOC 139. Mass Media and Popular Culture (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. A comparative analysis of the television, radio, record, cinema, and journalism industries as social institutions and a discussion of contemporary developments in mass communications theory. A study of the relationship between the social processes of modern society and the content of popular culture. Cross-listed with MCS 139.

**SOC 140. The Sociology of Women (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H; enrollment priority is given to Sociology majors, Sociology/Administrative Studies majors, and Sociology/Law and Society majors. Analyzes the role women have played in society, with an emphasis on modern American society. Considers some of the social determinants of women's positions and the efforts being made to bring about change.

**SOC 141. Men and Masculinity (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. A comparative and historical exploration of the social and personal meanings of masculinity with special emphasis on the American experience. Topics include socialization, sports and war, friendship, intimacy, sexuality, fathering, and work. Particular attention is paid to the role of masculinity in systems of gender inequality.

**SOC 142. Sociology of the Family (5)** Lecture, 3 hours; discussion, 1 hour; field, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. A comparative and historical treatment of the family. Explores major theoretical frameworks developed for conceptualizing the family as a social system within the context of the relation between social structure and family group processes.

**SOC 143. Urban Sociology (5)** Lecture, 3 hours; extra reading, 3 hours; field, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. A comparative examination of metropolitan and other urban communities, with emphasis on processes of urbanization. Cross-listed with URST 143.

**SOC 144. Family Violence (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. Addresses causes, identification, and prevention of all types of intrafamily abuse: child, sibling, spouse, and parent. Examines theories and research findings for practical field application. For upper-division students whose careers will bring contact with victims and/or perpetrators of family violence.

**SOC 145. Law and Subordination (5)** Lecture, 3 hours; field, 6 hours. Prerequisite(s): upper-division standing in Ethnic Studies or Sociology; ETST 128/SOC 128. A comparative and historical analysis of subordinated communities and law with special emphasis on integrating theoretical understanding of racial, class, and gender subordination. Field experience working directly with groups that have traditionally lacked equal access to the legal and judicial system. Cross-listed with ETST 145.

**SOC 147. Corrections (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H; enrollment priority is given to Sociology majors, Sociology/Administrative Studies majors, Sociology/Law and Society majors, Anthropology/Law and Society majors, Economics/Law and Society majors, History/Law and Society majors, Philosophy/Law and Society majors, Political Science/Law and Society majors, and Psychology/Law and Society majors. Involves a review, analysis, and criticism of the major techniques of resocialization of adult and juvenile offenders. Surveys the history, application, and theory of probation, parole, incarceration, and delinquency prevention programs. Discusses the methods involved in evaluating the effectiveness of correctional programs. May provide opportunities for field work.

**SOC 149. Organized Crime (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. A review of the operations, structures, history, and theories of syndicated crime in the United States. Special emphasis is given to the implications of organized crime on the development of criminological theory, the operation of formal organizations, and American ethnic relations.

**SOC 150. The Sociology of Economic Organizations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines how the scope and nature of formal and informal organizations are shaped by sociological processes external to them, such as the influence of governments, institutions, networks, and resources. Illustrates the processes with examples from contemporary United States and from other periods and cultures.

**SOC 151. Formal Organizations (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the structures of formal organizations, the forces that shape them, and the impact they have on their participants, their environments, and one another. Surveys the major classical and contemporary theories of human behavior in organizations.

**SOC 153. Sexualities (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 028. Examines sexual practices and identities from a sociological perspective. Discusses the evolution of knowledge about sexuality, historical and cultural variations in sexual norms and identities, sexual politics and popular culture, and the social control of sexuality (e.g., moral panics, sexual violence, and state regulation of sexual identities or practices).

**SOC 154. Sport and Gender (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 with a grade of "C" or better or SOC 001H with a grade of "C" or better; SOC 004 with a grade of "C" or better; enrollment priority is given to Sociology majors, Sociology/Administrative Studies majors, and Sociology/Law and Society majors. Considers the intersection of politics, economics, society, culture, and representation in sport. Combines theoretical work and applied study related to social theory and cultural studies. Assumes that gender is a fundamental factor in sport and vice versa.

**SOC 155 (E-Z). Topics in the Sociology of Gender (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 028. Intensively studies selected topics in the sociology of gender. E. Feminist Movements in the United States; G. Queer Theory. Segments are repeatable.

**SOC 156. Community (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Involves a historical and comparative treatment of the community as a social system; political and economic forces shaping the sense of community; and influences of urbanization, industrialization, and bureaucratization on local social systems.

**SOC 157. Social Networks (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the linkages among individuals in social networks. Topics include neighborhood and community networks, corporate and elite networks, and personal "ego" networks. Emphasis placed on the dynamics of social structures, how they operate to restrict individual behavior, and how they convey resources for social support and career success.

**SOC 158. Sociology of Religion (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. A comparative and analytic treatment of religion as a social institution. Focuses on the relationships of religion and other social institutions with particular emphasis on the American experience. Topics include religion as an agent of change as well as stability in society.

**SOC 159. Sociology of Law (5)** Lecture, 3 hours; discussion, 1 hour; field, 3 hours. Prerequisite(s): SOC 001 with a grade of "C" or better or SOC 001H with a grade of "C" or better; SOC 004 with a grade of "C" or better. Introduction to social scientific perspectives and research on the nature, sources, dimensions, and impact of law. Particular attention is given to the "values question" in defining and studying law as a set of social phenomena; conceptual issues and methodological strategies in establishing and interpreting linkages between legal and other social structures and processes; and analyzing the uses and limits of law in maintaining order and promoting social change.

**SOC 160. Sociology of Education (5)** Lecture, 3 hours; discussion, 1 hour; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative analysis of educational institutions in complex societies and their relation to a society's political and economic structure. Examines the school as a societal subsystem consisting of

teacher, student, and administrator roles with its own evolving subculture.

**SOC 161. Immigration and Society (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Analyzes the origins of immigration and its nature, patterns, and trends in the twentieth century in Western societies, with special emphasis on the United States. Topics include theories of immigration, causes of immigration, sources of immigrants, immigration laws, reactions to immigrants, and the effects of immigration on the host society.

**SOC 162. Linguistic Diversity in the United States (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the linguistic diversity that has characterized the socio-historical development of United States society.

**SOC 163. Social Forces and the Educational Condition of Chicanas/os (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the social forces that have shaped the Chicanas/os' educational condition and evaluates models in the sociology of education that explain their educational situation.

**SOC 164. Racial and Ethnic Diversity Issues in Higher Education (4)** Lecture, 3 hours; written work, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 160 or SOC 163. Explores the issue of diversity in higher education. Focuses on racial and ethnic minority students and faculty.

**SOC 165. Sociolinguistics and the Chicana/o Community (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the regional and social variation in language use within the Chicana/o community. Focuses on the maintenance of Spanish language use, private versus public domains of language use, the need for bilingual social services, language as a human right versus language as a constitutional right, and the political economy context of language. Also addresses general sociolinguistic theory and methodology.

**SOC 168. Development of Sociological Theory (5)** Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): SOC 001 with a grade of iCī or better or SOC 001H with a grade of iCī or better; enrollment priority is given to Sociology majors, Sociology/Administrative Studies majors, and Sociology/Law and Society majors. Covers the emergence of sociology as a systematic discipline. Provides a critical analysis of sociological theory from 1850 to 1920. Includes the theories of Comte, Tocqueville, Spencer, Marx, Simmel, Weber, Durkheim, and others during this period.

**SOC 169. Modern Sociological Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 with a grade of iCī or better or SOC 001H with a grade of iCī or better; enrollment priority is given to Sociology majors, Sociology/Administrative Studies majors, and Sociology/Law and Society majors. An analysis and critical evaluation of sociological theory from 1920 to the present. Explores the growth of current sociological theories and recent trends in conceptual formulations.

**SOC 171. Alternatives to Bureaucratic Organizations (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. Examines organizational models that challenge the alleged superiority of bureaucratic organization. Topics range from cooperatives, professional partnerships, and worker-owned firms to the use of participative management, autonomous teams, and employee stock ownership in otherwise conven-

tionally owned firms. Recommended for Business Administration majors.

**SOC 173. Social Psychology: Sociological Orientation (5)** Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Study of the sociological contributions to theory and research in social psychology bearing on the relationship between culture and group life to human behavior and personality.

**SOC 174. Socialization and Personality (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. An analysis of socialization from various theoretical perspectives with emphasis on the impact of patterns of child rearing on personality development. Treatment is historical and cross-cultural, with particular attention to the relation among family structure, social structure, and socialization processes.

**SOC 175. Social Roles and Interaction (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 with a grade of iCī or better or SOC 001H with a grade of iCī or better; SOC 004 with a grade of "C" or better; enrollment priority is given to Sociology majors, Sociology/Administrative Studies majors, and Sociology/Law and Society majors. Covers the nature of face-to-face contact between persons in everyday life. Examines the relationship among the social self, social roles, and communication in the day-to-day activities of people in informal groups, closed establishments, and public contacts.

**SOC 176. The Sociology of Work in Organizations (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. Emphasizes the roles of individuals in organizations. Topics include the effects of jobs on workers, long-term trends in the nature of work, and differences in work among major segments of the labor force. Cross-listed with BUS 176.

**SOC 177 (E-Z). Topics in Social Psychology: Sociological Orientation (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 030. Intensively studies selected topics in social psychology, such as the individual and social change, attribution theory, experimentation in social psychology, exchange and consistency theories in social psychology, and applied social psychology. E. Social Psychology of Gender; G. Theories of Interpersonal Behavior.

**SOC 178. Sociology of Emotions (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 173 or SOC 174 or SOC 175. Surveys theory and research on emotions. Special attention is given to sociological and social psychological theories. Also covers evolutionary, biological, and cognitive theories. Studies a range of emotions such as shame and embarrassment, guilt, empathy and sympathy, jealousy and envy, and anger.

**SOC 179. Social Movements and Collective Action (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 168 or SOC 169. Examines the emergence and outcomes of collective action and social movements. Considers the conditions under which social movements develop and why they succeed or fail. Utilizes sociological theories to understand collective action and social movements. Includes analysis of the U.S. civil rights movement, feminist movement, and LGBT movement.

**SOC 180. Deviance and Control (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. An introduction to the sociological analysis of deviance-as defined by informal and formal processes of social control in varying cultural, legal, and political

contexts. Emphasis is upon the social construction and imposition of standards (norms) by which some personal and collective attributes and actions come to be negatively evaluated and penalized, while others are positively evaluated and rewarded.

**SOC 181. World-Systems and Globalization (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. Systematic comparisons of societies and world-systems with emphasis on changes in the logic of social development.

**SOC 182. Urban Problems (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An interdisciplinary examination of selected urban problems such as civil disorders, transportation, housing, welfare, and planning. Cross-listed with URST 182.

**SOC 183 (E-Z). Special Topics in Sociology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Explores special topics in sociology. H. Aging in America; M. Geographic Information Systems and Mapping in Sociology and other Social Sciences: Principles, Techniques, and Research; N. Fear and the Media; P. Poverty and Welfare; T. Intersocietal Conflict: Political Islam, Terrorism, and the United States; V. Power and Society; W. Social Mobility.

**SOC 184. Environmental Sociology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. A sociological approach to the study of mainstream environmentalism, societal implications of environmental reform, the nature of distributive impacts (costs and benefits), environmental conflict resolution, land-use decision making, and the placement of noxious facilities in minority, working class, and poor communities.

**SOC 185. Population Forecasting (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Introduces the fundamentals of population forecasting, including terminology, materials, and methods.

**SOC 190. Special Studies (1-5)** Individual study, 3-15 hours. Prerequisite(s): upper-division standing; consent of instructor and Department Chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 15 units.

**SOC 195. Senior Thesis (2-4)** Total credit may not exceed 12 units. Required for all participants in the department's senior honors program, who must enroll for 4 units per quarter for a total of three quarters. Students wishing to undertake senior thesis projects outside the senior honors program, may enroll in SOC 195 for 2-4 units per quarter for one, two, or three quarters.

**SOC 197. Research for Undergraduates (1-4)** variable hours. Prerequisite(s): upper-division standing with consent of instructor. Directed original research. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SOC 198-I. Individual Internship in Sociology (1-12)** Written work, 1-12 hours; internship, 2-24 hours. Prerequisite(s): senior standing; grades of "C" or better in SOC 001 or SOC 001H, SOC 004, and 12 upper-division units in sociology; consent of instructor. Individual internship in community agencies to observe community processes. Course is repeatable to a maximum of 16 units.

**SOC 199H. Senior Honors Research (1)** Required seminar for all participants in the department's senior honors program. Must be taken in conjunction with SOC 195, and for a total of three quarters.

## Graduate Courses

**SOC 201A. Research Perspectives: Quantitative Methods (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SOC 005 or equivalent, graduate standing; or consent of instructor. An analysis of epistemological questions, conceptualization and measurement issues, survey research design, sampling, design of survey instruments, principles of survey administration, experimental design, and data processing.

**SOC 201B. Research Perspectives: Qualitative Methods (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SOC 004 or equivalent, graduate standing; or consent of instructor. An overview of the uses of qualitative methods in sociology. Topics include epistemological questions, participant and systematic observation, intensive interviewing, participatory methods, and the uses of documentary and historical resources.

**SOC 202A. History of Sociological Theory (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the development of sociological theory from 1830 to 1930, stressing the major ideas, concepts, and principles developed by early social theorists.

**SOC 202B. Contemporary Sociological Theory (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 202A or consent of instructor. Examines sociological theory from 1930 to the present, stressing the major ideas, analyses, and principles developed by contemporary theorists.

**SOC 203A. Descriptive and Multivariate Statistics (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SOC 005 or equivalent, SOC 201A or SOC 201B, graduate standing; consent of instructor. Covers principles of partial and joint association, variance, and statistical estimation through the use of log-linear, multiple regression, and ANOVA models.

**SOC 203B. Multiequation and Measurement Models (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SOC 005 or equivalent, SOC 201A, SOC 201B, SOC 203A, graduate standing; or consent of instructor. Covers principles of multiequation systems, latent variables, and factors through the use of confirmatory factor and covariance structure models. Covers reliability and validity assessment for scaling techniques.

**SOC 205. Categorical and Survival Data Analysis (4)** Seminar, 3 hours; laboratory, 1 hour; extra reading, 2 hours. Prerequisite(s): SOC 201A, SOC 201B, SOC 203A, SOC 203B; graduate standing or consent of instructor. Introduces students to the analysis of limited dependent variables in social science and epidemiologic research. Covers in detail survival analysis, including recent advances and emerging controversies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 210. Citizenship (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers theories of citizenship. Focuses on the intersection of politics, economics, and culture, combining theoretical work and applied study. Designed for graduate students interested in social and political theory, cultural studies, and cultural policy studies. Sociology graduate students who are not advanced to candidacy for the Ph.D. receive a letter grade; other students receive a letter grade or petition for a Satisfactory (S) or No Credit (NC) grade.

**SOC 211. Media Sociology (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or

consent of instructor. Surveys research on the production of news, mass entertainment, and culture, with emphases on constructions of audiences and introduction of new media technologies. Sociology graduate students who are not advanced to candidacy for the Ph.D. receive a letter grade; other students receive a letter grade or petition for a Satisfactory (S) or No Credit (NC) grade.

**SOC 222. Evolutionary Sociology (4)** Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing. Reviews theory and research within sociology on evolutionary processes. Includes stage models of societal evolution, rise and demise of inter-societal or world systems, and biological bases for human behavior, interaction, and social organization.

**SOC 232. Proseminar in Sociology (2)** Lecture, 2 hours. Prerequisite(s): admission to the graduate program. Graduate orientation to sociology as a scholarly discipline and empirical science. Required of all first year graduate students. Graded Satisfactory (S) or No Credit (NC).

**SOC 235. Methods and Materials of Demography (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the methods and materials of demography.

**SOC 240. Sociology of Gender (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Course will cover a broad variety of issues in the sociology of gender including socialization to gender roles, sexuality and sexual relations, housework, changing patterns of labor force participation, women in politics, and other germane issues. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

**SOC 242 (E-Z). Sociological Theory (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 202A or SOC 202B; graduate standing; consent of instructor. Advanced study in sociological theory: E. History of Theory; F. Issues in Contemporary Theory; G. Issues in Theory Construction; M. Macrostructural Analysis. May be graded Satisfactory (S) or No Credit (NC) with permission of Graduate Advisor.

**SOC 243 (E-Z). Special Topics in Sociology (4)** Lecture, 3 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): graduate standing; consent of instructor. Critical analysis of current theory and research in special areas of sociology. Covers a single topic not contained in a regular course. Each topic is announced when the course is offered. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**SOC 244. Institutional Analysis (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The comparative and historical analysis of human social institutions, with emphasis on: (a) the emergence and development of the basic institutional systems of economy, polity, kinship, religion, law, and education; (b) the structure and process of these institutions in varying types of societies; (c) the interrelation of these institutions to each other and to other structuring processes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

**SOC 245. Large-Scale Organizations (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A review of the sociological literature on large-scale organizations. Provides an introduction to rational, political, ecological, economic, and institutional models of large-scale

organizations. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

**SOC 246. Race and Class Inequality (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the various theories of racial and class inequality. Areas covered will include social scientific explanations for racial and ethnic inequality; ideological justifications for racial, ethnic, and class inequality; intersection of caste, class, and race in world inequality; and strategies to end inequality. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

**SOC 248. Core Course on Social Psychology (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A review of the sociological literature on social psychology. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**SOC 249. Contemporary Research and Theory in Criminology and Sociological Studies (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Review of basic issues and major contributions in studies of crime, deviance, and law. May be taken Satisfactory (S) or No Credit (NC) with permission of instructor and advisor.

**SOC 250. Research Practicum (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): SOC 201A, SOC 201B. A seminar of supervised research in which students are expected to integrate theory with data, within the context of work on a topic of individual choice. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SOC 251. Current Research in Political Economy and Global Social Change (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews current research in the field of political economy and global social change, with special emphasis on new developments and promising new directions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 252. Current Research in Economic and Organizational Sociology (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on recent literature in economic and organizational sociology, including recent developments in network, institutional, and ecological approaches. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 253. Current Research in Organizations and Institutions (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews the latest research and theory on organizations and institutions, focusing on the relationship between organizations and institutions or between one institutional complex and the organizational systems within it. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 254. Current Research in Social Psychology (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews current theory and research and addresses future directions in social psychology. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 255 (E-Z). Topics in Large-Scale Organizations (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced study of large-scale organizations: I. Organizational Theory; L. Methods

of Organizational Research; M. The Sociology of Work; N. Economic Organization; O. Social Organization of Sciences. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 256. Current Research in Feminist and Gender Sociology (4)** Seminar, 2 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews current theory and research in feminist and gender sociology, with particular attention to new developments in the field. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

**SOC 257 (E-Z). Topics in Institutional Analysis (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced seminars in institutional analysis: E. Economic Sociology; F. The Sociology of Family and Kinship; G. The Sociology of Education; J. Political Sociology. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 258. Current Research in the Sociology of Families and Loving Relationships (4)** Seminar, 2 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews current theory and research in the sociological study of families, marriage, and loving relationships. Focuses on issues of gender, race, class, and sexual inequalities. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination.

**SOC 261. World-Systems Analysis (4)** Seminar, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on social evolution, world-systems analysis, and globalization. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

**SOC 262. Feminist Theory (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of recent debates about theory and method in gender studies. Explores relationships between feminist theory, feminist practice, and social science. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 263. Women and Work in World Historical Perspective (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the role of women as workers in a variety of societies. Considers the role of women in developments and the impact of development on women's economic roles. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 264 (E-Z). Topics in Gender Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced study in the sociology of gender. E. Gender and Families; F. Domestic and Sexual Violence; G. The Sociology of Men; M. Gender in Comparative Perspectives; P. Gender, Politics, and Public Policy; T. Transnational Sex, Romance, and Marriage. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 265 (E-Z). Topics in Race and Class Inequality (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced study in race and class inequality. F. Black America; I. Chicano Sociology; J. World Inequality; R. Racial, Ethnic, and Immigrant Families.

May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 266. Race and Ethnic Relations (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A review of sociological literature on race and ethnic minorities, patterns of conflict and ethnic antagonism, and systems of dominance. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 268. Law, Race, Class, and Gender (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Presents an analysis of how issues of race, class, and gender shape legal thought and jurisprudence. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

**SOC 278. Punishment and Correction: Evaluating Theories and Policies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Takes a critical and evaluative approach to the punishment and correctional systems, assessing what "works and doesn't work" in efforts to reduce crime and delinquency. Examines prisons, probation, and other crime control measures from a perspective emphasizing the need for systematic evaluation research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 279. Analysis of the Criminal Justice Process (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): either graduate standing and SOC 249 or consent of instructor. This course examines in depth the penal social control agencies of the police, the courts, and the correctional system both from ideological and operational points of view. The effects on the individual and society of these mechanisms as well as alternative approaches to formal control mechanisms are examined. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

**SOC 280 (E-Z). Topics in Criminology and Sociological Studies (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced seminars in criminology and sociological studies. E. Patterns of Criminal and Deviant Behavior; F. Ecological Perspectives on Crime and Delinquency; G. Biological and Psychobiological Studies of Crime and Delinquency; I. Conflict and Radical Approaches in Criminology and Sociological Studies; J. Sociological Theories of Law; K. Law, Power, and Social Conflict; M. Political Criminality; S. Substance Use and Crime. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 281. Political Economy and Global Social Change (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on classical and contemporary political economy, social movements, and the historical development of social systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 282. International Migration (4)** Seminar, 4 hours. Prerequisite(s): SOC 201A, SOC 203A. A hands-on research course in the concepts, theories, and techniques used in the analysis of international migration. Covers the nature and origins of and patterns and trends in global migration from colonial times to the twenty-first century. Provides an overview of migration theories, migration policies, and current research on immigration. Course is repeatable.

**SOC 284. Sociology of the Family (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers major theoretical frameworks and empirical research on the sociology of the family. Reviews research on courtship, marriage, parenthood, divorce, child socialization, and intergenerational family relations from a comparative perspective. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 285 (E-Z). Topics in Family and Social Psychology (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced study in family and social psychology. E. Theory in Social Psychology; G. The Interaction Process; I. Sociolinguistics; J. Social Psychology of Emotions; K. Small Groups; M. Social Psychology of the Family; N. Social Psychology of Gender; P. Families and the Life Course; S. Self and Identity. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

**SOC 290. Directed Studies (1-6)** scheduled research, 3-15 hours; consultation, 1 hour. Prerequisite(s): graduate standing and consent of instructor. This course is designed to provide students with reading and research work under the tutorial supervision of a faculty member in support of developing their knowledge of specialty areas and/or preparing original research work. With consent of the graduate advisor, this course may be taken for a letter grade to satisfy required seminars in the period of specialization if regular seminars are not available. Otherwise course will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SOC 291. Individual Study in Coordinated Areas (1-12)** Individual study, 3-36 hours. Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for doctoral examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SOC 293. Research Topics in Sociology (2)** Lecture, 2 hours. Prerequisite(s): graduate standing in Sociology. A series of lectures by guests, faculty, and advanced graduate students on research topics in sociology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SOC 297. Directed Research (1-6)** Graded Satisfactory (S) or No Credit (NC).

**SOC 299. Research for Thesis or Dissertation (1-12)** Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Courses

**SOC 301. Directed Studies in the Teaching of Sociology (2)** Consultation, 1 hour; practicum, 3 hours. Prerequisite(s): consent of instructor; prior or concurrent enrollment in the Teaching Assistant Development Program offered by the Graduate Division. Discussion and evaluation of pedagogical techniques and materials used in the teaching of sociology at the college level. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SOC 302. Teaching Practicum (2-4)** Consultation, 1 hour; practicum, 3-9 hours. Prerequisite(s): teaching assistant status in the Sociology Department or consent of instructor. Supervised teaching in a college-level class. Deals with the problems and techniques of teaching, including handling discussions, preparation and grading of examinations and written work, and student-instructor relations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SOC 401. Grant Writing in the Social Sciences (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Presents an overview of successful grant writing. Topics include preproposal planning, the grant writing process, logic and research model development, integrating proposal elements, and what to do if a grant is rejected. Participants actively develop a research proposal and review potential funding sources. Graded Satisfactory (S) or No Credit (NC).

## Soil and Water Sciences

**Subject abbreviation: SWSC**  
**College of Natural and Agricultural Sciences**

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### Professors

Christopher Amrhein, Ph.D. *Soil Chemistry* (Environmental Sciences)  
Michael A. Anderson, Ph.D. *Environmental Chemistry* (Environmental Sciences)  
David E. Crowley, Ph.D. *Soil Microbiology* (Environmental Sciences)  
Jiangying "Jay" Gan, Ph.D. *Environmental Chemistry* (Environmental Sciences)  
Robert C. Graham, Ph.D. *Soil Mineralogy and Pedology* (Environmental Sciences)  
David R. Parker, Ph.D. *Soil Biogeochemistry* (Environmental Sciences)  
Daniel Schlenk, Ph.D. *Aquatic Ecotoxicology* (Environmental Sciences)  
Jiri Simunek, Ph.D. *Hydrology* (Environmental Sciences)  
Laosheng Wu, Ph.D. *Soil Physics* (Environmental Sciences)  
Marylynn V. Yates, Ph.D. *Environmental Microbiology* (Environmental Sciences)  
Paul J. Ziemann, Ph.D. *Atmospheric Chemistry* (Environmental Sciences)

### Professors Emeriti

Andrew C.-S. Chang, Ph.D. *Agricultural Engineering* (Environmental Sciences)  
Walter J. Farmer, Ph.D. *Soil Chemistry* (Environmental Sciences)  
William T. Frankenberger, Jr., Ph.D. *Soil Microbiology* (Environmental Sciences)  
William A. Jury, Ph.D. *Soil Physics* (Environmental Sciences)  
John Letey, Jr., Ph.D. *Soil Physics* (Environmental Sciences)  
Lanny J. Lund, Ph.D. *Soil Morphology, Genesis, and Classification* (Environmental Sciences)  
Albert L. Page, Ph.D. *Soil Chemistry* (Environmental Sciences)

### Associate Professors

David M. Crohn, Ph.D. *Biosystems Engineering* (Environmental Sciences)  
James Sickman, Ph.D. *Watershed Hydrology and Biogeochemistry*

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The graduate program in Soil and Water Sciences is not currently accepting new students. Students interested in graduate study in soil or water sciences can be accommodated in other graduate programs and are encouraged

to contact the Environmental Sciences Student Affairs Offices at (951)827-5103 or (951)827-2441 for more information on how to apply.

## Graduate Program

The graduate program in Soil and Water Sciences is administered by the Department of Environmental Sciences and offers both M.S. and Ph.D. degrees.

**Admission** The university requires GRE General Test scores (verbal, quantitative, analytical). As well as fulfilling the university requirements for admission to the Graduate Division, students must satisfy certain program requirements. Admission to the program requires a baccalaureate degree with preparation in both physical and life sciences. Students should have completed one year of general chemistry, as well as courses in general physics, organic chemistry, calculus through integrals, general biology, statistics, and physical geology or physical geography. Students who have not taken these courses are directed by the admissions and review committee and their major advisor to the appropriate curriculum to correct the deficiencies.

**Course Work** Students, in consultation with their advisory committee and other faculty as appropriate, develop a program of course work to satisfy the degree requirements and the career objective. A study list of required and elective courses must be completed by the end of the second quarter of study and submitted to the admissions and review committee.

Students must complete one course in each of the following four broad categories of soil and water sciences: chemistry, physics, biology, and natural structure and diversity. Students may have completed these prior to admission or they may take them early in their graduate program. Courses at UCR that meet the requirement of each category are listed below.

### Chemistry

ENSC 104/SWSC 104 (Environmental Soil Chemistry)  
CHEM 136/ENSC 136/ENTX 136/  
SWSC 136 (Chemistry of Natural Waters)

### Physics

ENSC 107/SWSC 107 (Soil Physics)  
ENSC 163 (Hydrology)

### Biology

ENSC 133/MCBL 133/SWSC 133 (Environmental Microbiology)  
BPSC 134/ENSC 134/SWSC 134 (Soil Conditions and Plant Growth)  
ENSC 141/MCBL 141/SWSC 141 (Public Health Microbiology)

### Natural Structure and Diversity

ENSC 138/GEO 138/SWSC 138 (Soil Morphology and Classification)  
ENSC 140/SWSC 140 (Limnology)

Students must present a departmental seminar summarizing results of their thesis or dissertation or internship during the final quarter of matriculation.

For a complete description of the program's requirements, students are referred to the *Guidelines for Graduate Students* available in the Environmental Sciences Student Affairs Office. Other general university requirements for advanced degrees are given in the Graduate Studies section of this catalog.

## Master's Degree

The Department of Environmental Sciences offers the M.S. degree in Soil and Water Sciences.

Only seminar courses, directed study, internship, thesis and dissertation hours may be taken on a Satisfactory (S)/No Credit (NC) basis.

**Plan I (Thesis)** Students must complete a minimum of 36 quarter units of graduate and upper-division undergraduate courses in, or significantly related to, soil and water sciences. At least 24 of the 36 units must be in graduate courses. A maximum of 12 of these units may be in graduate research for the thesis. No more than 4 units of SWSC 290 and 2 units of SWSC 250 may be applied toward the degree. Students must pass a final oral examination.

**Plan II (Comprehensive Examination)** Students must complete a minimum of 36 quarter units of graduate and upper-division undergraduate courses in or significantly related to soil and water sciences. At least 18 units must be in graduate courses. Students may count no more than 2 units of SWSC 250 and 6 units of SWSC 298-I toward the required 18 units and no units from graduate research for thesis or dissertation (SWSC 297 or SWSC 299).

Students take a comprehensive written examination that covers fundamental topics in soil and water sciences. The written exam, which is three to four hours long, is prepared and evaluated by a committee appointed by the department chair. The exam is taken during the latter part of the final quarter in the M.S. program. Students must wait at least eight weeks before retaking a failed examination. Students failing the examination twice are dismissed from the program.

## Doctoral Degree

The Department of Environmental Sciences offers the Ph.D. in Soil and Water Sciences.

The Ph.D. program provides specialized, research-based training in a variety of soil and water sciences fields. In addition to the four core courses enumerated above, the minimum requirements for the Ph.D. degree include the following:

1. Complete all course work with an average GPA of 3.0 or greater
2. Pass both the written and oral qualifying examinations
3. Complete at least 4 units of Teaching Practicum (SWSC 302)

4. Submitting an approved research dissertation

**Course Work** Before advancement to candidacy, Students must complete all required course work as approved by their advisory committee with an average GPA of 3.0 or greater.

### Written and Oral Qualifying Examinations

Students must pass written qualifying examinations administered by a five-member committee and an oral examination administered by the same committee; the latter includes the defense of an original research proposal. The examining committee must include one member from outside the graduate program. After successfully completing these examinations and complying with university rules, students are advanced to candidacy.

**Dissertation** Students must submit a dissertation consisting of original research in the field of soil and water sciences. The dissertation must be accepted by a three-member dissertation committee. Students must then pass a final oral examination, which deals primarily with the dissertation and is conducted by the dissertation committee.

**Normative Time to Degree** 15 quarters

## Upper-Division Courses

**SWSC 100. Introduction to Soil Science (4) F** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; GEO 001 is recommended. Explores the fundamental principles of soil science and soils as a natural resource. An introduction to the morphology, physics, chemistry, microbiology, fertility, classification, development, and management of soils in relation to the environment. Cross-listed with ENSC 100. Credit is awarded for only one of ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H. **Amrhein**

**SWSC 100H. Honors Introduction to Soil Science (4) F** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; GEO 001 is recommended. Honors course corresponding to ENSC 100. Explores the fundamental principles of soil science and soils as a natural resource. An introduction to the morphology, physics, chemistry, microbiology, fertility, classification, development, and management of soils in relation to the environment. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with ENSC 100H. Credit is awarded for only one of ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H. **Amrhein**

**SWSC 104. Environmental Soil Chemistry (4) F** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 or ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H or consent of instructor. Quantitative study of the chemistry of the solid, liquid, and gas phases in soils and sediments. Topics include solid and solution speciation, mineral solubility, ion exchange and adsorption reactions, oxidation-reduction, and the chemistry of organic contaminants and toxic trace elements in soils. Cross-listed with ENSC 104.

**SWSC 107. Soil Physics (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B or MATH 09HB; PHYS 002A; or consent of instructor. Topics include physical properties of soils and meth-

ods of evaluation. Emphasis is on movement of water, heat, gases, and chemicals through soil. Cross-listed with ENSC 107. **Wu**

**SWSC 120. Soil Ecology (3) S** Lecture, 3 hours. Prerequisite(s): BIOL 002 or both BIOL 005A and BIOL 05LA; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC. Examination of soil biota and their relationships with plants and the soil environment. Emphasis is on soil biotic interactions that influence soil fertility, plant disease, and plant growth. Examines the importance of the different microbial and faunal groups from the rhizosphere to the ecosystem level. Cross-listed with ENSC 120 and NEM 120. **Crowley, De Ley**

**SWSC 127. Fate and Transport of Contaminants in Soil (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; MATH 009B or MATH 09HB. Topics include interactions of environmental conditions with abiotic and biotic transformation and transport of major organic and inorganic contaminants in soil. Cross-listed with ENSC 127. **Gan**

**SWSC 133. Environmental Microbiology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C; or consent of instructor. Introduction to nonpathogenic microorganisms in the environment. Topics include an introduction to microbial biology and microbial and metabolic genetic diversity; methods; symbiotic interactions; biofilms; and geomicrobiology and biogeochemistry. Explores life in extreme environments and the effects of the physical and chemical environment on microbes. Cross-listed with ENSC 133 and MCBL 133. **M. Allen**

**SWSC 134. Soil Conditions and Plant Growth (4) W** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104, ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; or consent of instructor. A study of the chemical, physical, and biological properties of soils and their influence on plant growth and development. Topics include soil-plant water relations; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses and rhizosphere processes. Cross-listed with BPSC 134 and ENSC 134. **Crowley**

**SWSC 136. Chemistry of Natural Waters (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 with a grade of "C-" or better or ENSC 104/SWSC 104 with a grade of "C-" or better or consent of instructor. Introduction to processes controlling the chemical composition of natural waters. Topics include chemical equilibria, acid-base and coordination chemistry, oxidation-reduction reactions, precipitation-dissolution, air-water exchange, and use of equilibrium and kinetic models for describing marine nutrient, trace metal, and sediment chemistry. Cross-listed with CHEM 136, ENSC 136, and ENTX 136. **Parker**

**SWSC 138. Soils of Natural Ecosystems and Landforms (4) S** Lecture, 3 hours; laboratory, 4 hours per quarter; one half-day field trip and three 1-day field trips. Prerequisite(s): ENSC 100/SWSC 100 or ENSC 100H/SWSC 100H; GEO 001 or GEO 002; or consent of instructor. The study of soils in diverse natural environments. Examines how soils form and their roles in ecosystem function and landscape processes. Includes causes of soil variability, fundamentals of soil classification, and indicators of current and past environmental conditions. Field trips emphasize the description and interpretation of soils. Cross-listed with ENSC 138 and GEO 138. **Graham**

**SWSC 140. Limnology (4) S** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; ENSC 101. Study of surface waters. Considers in detail the physical and chemical processes in surface waters, aquatic biology, ecosystem dynamics, and aspects of surface water quality and modeling. Cross-listed with ENSC 140. **Anderson**

**SWSC 141. Public Health Microbiology (4) F** Lecture, 4 hours. Prerequisite(s): BIOL 002 or both BIOL 005A and BIOL 05LA; BIOL 003 or BIOL 005B; upper-division standing; or consent of instructor. Introduction to transmission of human pathogenic microorganisms through environmental media, including drinking water, wastewater, and air. Topics include characterization of environmentally transmitted pathogens, microbial risk assessment, sampling and detection methods for microorganisms in environmental samples, waterborne disease outbreaks, recycling or reuse of wastewater, microbial regulations and standards, and indoor air microbiology. Cross-listed with ENSC 141 and MCBL 141. **Yates**

**SWSC 190. Special Studies (1-5) F, W, S** conference and discussion, variable time. Prerequisite(s): advanced standing. Directed group study in soil and water sciences for advanced undergraduates. Course is repeatable.

**SWSC 197. Research for Undergraduates (1-4) F, W, S** conference and discussion, variable time. Prerequisite(s): advanced standing. Individual research on a problem relating to soil and water sciences to be conducted under the guidance of an instructor. Course is repeatable.

## Graduate Courses

**SWSC 203. Surface Chemistry of Soils (4) W, Odd Years** Lecture, 4 hours. Prerequisite(s): CHEM 109 or CHEM 110A; ENSC 104/SWSC 104; or consent of instructor. Quantitative description of the properties of and reactions at the soil-water interface, including charge properties, the electric double layer, ion exchange, and surface complexation reactions. **Anderson**

**SWSC 204. Environmental Organic Chemistry (4)** Lecture, 4 hours. Prerequisite(s): CHEM 109 or CHEM 110A; CHEM 112A, CHEM 112B; or consent of instructor. ENSC 104/SWSC 104 is recommended. Considers the properties and reactions of organic contaminants in soils and surface waters, including partitioning, exchange, and transformation reactions. **Gan**

**SWSC 206. Principles and Theories Relating to Arid Zone Soils (4) S, Odd Years** Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): ENSC 104/SWSC 104. Characteristics of soils in arid regions; soil and water resources; genesis and properties of salt-affected soils, principles and methods of reclamation; agronomic factors; salt tolerance, nutrition, and crop selection criteria. **Amrhein**

**SWSC 208. Ecotoxicology (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, CHEM 112A, CHEM 112B; or consent of instructor. Introduction to the impact of chemicals upon ecological systems. Examination of the fate and effects of environmental chemicals in various hierarchies of biological organization to learn how to carry out precise and accurate assessments of ecological risk. Cross-listed with ENSC 208 and ENTX 208. **Schlenk**

**SWSC 211. Microbial Ecology (3) S, Even Years** Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Application of ecological princi-

ples to microbial communities. Emphasizes methods for analysis of diversity and community structure and statistical methods relating genetic and biochemical fingerprints to functional properties. Case studies explore applications for agriculture, disease biocontrol, and bioremediation of environmental contaminants. Cross-listed with MCBL 211. **Crowley**

**SWSC 213. Soil Mineralogy (3) W, Even Years** Lecture, 3 hours. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; GEO 001. ENSC 104/SWSC 104 and ENSC 138/GEO 138/SWSC 138 are recommended. Covers the composition, structure, and classification of minerals commonly found in soils. Focuses on the origin, occurrence, and properties of soil minerals in relation to chemical, pedologic, and geomorphic conditions. Includes theory of mineral identification techniques including X-ray diffraction, thermal and infrared analysis, and electron microscopy. **Graham**

**SWSC 213L. Soil Mineralogy Laboratory (4) W, Even Years** Discussion, 1 hour; laboratory, 9 hours. Prerequisite(s): concurrent enrollment in SWSC 213. Training in methods of soil mineralogical analysis, including sample preparation, X-ray diffraction, electron microscopy, thermal analysis, infrared spectroscopy, and surface area analysis. Data interpretation and presentation. **Graham**

**SWSC 214. Soil and Water Chemistry Laboratory (2) F, Even Years** Laboratory, 6 hours. Prerequisite(s): concurrent enrollment in ENSC 104/SWSC 104 or consent of instructor. A series of advanced laboratory exercises involving modern analytical methods for soils, sediments, and surface waters. Topics include trace metal speciation, isotope exchange kinetics, mineral solubility, adsorption isotherms, redox couples, and partitioning and biodegradation of organic contaminants. Cross-listed with ENSC 214.

**SWSC 217. Vadose Zone Processes (4) W, Even Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B or MATH 09HB, ENSC 107/SWSC 107; or consent of instructor. A study of physical and mathematical descriptions of transient flow and transport processes in the vadose zone. Emphasis is on numerical solutions to equations describing the movement of water, gas, contaminants and heat, including chemical and biological reactions. Explores mathematical models for direct and inverse solutions, spatial heterogeneity, and determination of soil hydraulic properties. Cross-listed with ENSC 217. **Simunek**

**SWSC 226. Soil Geomorphology (4) F, Odd Years** Lecture, 2 hours; laboratory, 6 hours; two Saturday field trips per quarter. Prerequisite(s): ENSC 138/GEO 138/SWSC 138, GEO 162, or equivalents. Examines the interaction of pedogenic and geomorphic processes during the Quaternary, with an emphasis on the rate of these processes. Group research includes field data collection and analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with GEO 226. **Graham, Kendrick**

**SWSC 232. Biogeochemistry (4) W, Odd Years** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. A study of the biogeochemical cycling and exchange of carbon and important nutrients (N, S, base cations) between the lithosphere, hydrosphere, and atmosphere. Quantitatively describes processes at scales ranging from local to global. Addresses modern concerns about water and atmospheric quality, including global climate change. Cross-listed with ENSC 232. **Parker**

**SWSC 245. Chemistry and Physics of Aerosols (3) F, Odd Years** Lecture, 3 hours. Prerequisite(s): CHEM 109, CHEM 110B; or consent of instructor.

Fundamentals of chemical and physical processes controlling behavior and properties of airborne particles. Topics include particle mechanics; electrical, optical, and thermodynamic properties; nucleation; surface and aqueous-phase chemistry; gas-particle partitioning; sampling; size and chemical analysis; atmospheric aerosols; and environmental effects. Cross-listed with CHEM 245 and ENTX 245. **Ziemann**

**SWSC 250. Seminar in Soil and Water Sciences (1-2) F, S, W** Seminar, 1 hour. Formal seminars on selected topics in the field of soil and water sciences by graduate students, staff, and invited scholars. Two units of credit for students who present seminars and one unit of credit for students enrolled. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SWSC 262. Wetlands Biogeochemistry Seminar (2)** Seminar, 2 hours. Prerequisite(s): CHEM 136/ENSC 136/ENTX 136/SWSC 136 or ENSC 104/SWSC 104; ENSC 141/MCBL 141/SWSC 141; or consent of instructor. Involves oral reports and discussion by students, faculty, and visiting scholars on current research topics in biogeochemical cycling in wetland environments. Emphasis is on environmental quality issues, use of constructed wetlands as recipients of various wastewaters, and the role of wetlands in global nutrient cycles and thus climatic change. Graded Satisfactory (S) or No Credit (NC).

**SWSC 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): graduate standing and consent of instructor. Individual studies on specially selected topics in soil and water sciences under the direction of a staff member. No more than four units may be applied toward the unit requirements for the Master's degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

**SWSC 297. Directed Research (1-6)** conference and research, variable time. Graded Satisfactory (S) or No Credit (NC).

**SWSC 298-I. Individual Internship (1-12)** Internship, 3-36 hours. Prerequisite(s): graduate standing in Soil and Water Sciences. Individual study or apprenticeship with an appropriate professional individual or organization and an academic advisor to gain professional experience and knowledge on a topic related to soil or water quality. Graded Satisfactory (S) or No Credit (NC). Course is repeatable but only 6 units may be used toward the 36 units required for the M.S. degree.

**SWSC 299. Research for Thesis or Dissertation (1-12)** conference and research, variable time. Prerequisite(s): consent of a staff member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**SWSC 302. Teaching Practicum (1-4) F, W, S** Practicum, 4-12 hours. Prerequisite(s): graduate standing. Supervised teaching in Soil and Water Sciences or Environmental Sciences courses. Required for all teaching assistants in Soil and Water Sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

# Southeast Asian Studies Graduate Program

**Subject abbreviation: SEAS**

**College of Humanities, Arts, and Social Sciences**

Mariam Beevi Lam, Ph.D., Director  
Program Office, INTS 3114  
(951) 827-1391; [seatrip.ucr.edu](mailto:seatrip.ucr.edu)

## Committee in Charge

Hendrik M.J. Maier, Ph.D. (Comparative Literature and Foreign Languages)  
Mariam Beevi Lam, Ph.D. (Comparative Literature and Foreign Languages)  
René T.A. Lysloff, Ph.D. (Music)  
Sally A. Ness, Ph.D. (Anthropology)  
Deborah A. Wong, Ph.D. (Music)

## Graduate Program

The Master's Program in Southeast Asian Studies is an interdepartmental program centered on the study of the arts and cultures of Southeast Asia and its diasporas. To understand Southeast Asia as a region, students need to make sense of and engage with its diverse expressive forms of culture (including visual arts, literature, and performance) which are crucial in building and maintaining individual as well as group identity both within and across national or ethnic boundaries.

This program is designed for students with a strong interest in Southeast Asia, including those already admitted or enrolled in another graduate program. Students can be concurrently enrolled in both the Southeast Asian Studies M.A. program and another graduate degree program.

**Admission** All applicants must fulfill the standard admission requirements as established by the Graduate Division. Additionally, applicants must submit a Statement of Purpose to indicate a serious interest in Southeast Asian Studies (or a specific country or area in this region) as well as a writing sample (such as a past term paper or course essay) to demonstrate basic skills of scholarship.

**Foreign Language** Students must acquire (or increase) a distinct level of proficiency in at least one language relevant to Southeast Asian Studies prior to beginning research for the thesis and no later than the fifth quarter in the program. The required proficiency can be demonstrated by way of an exam or by completing one year of course work with a "B" or better.

International students from Southeast Asia may use their native language to fulfill this requirement.

**Course Work** All students are required to pass the Proseminar in Southeast Asian Studies (SEAS 200) with a "B" or better. Additionally,

students must pass (with a "B" or better) four of the following six seminar courses:

- SEAS 201 Southeast Asian performance
- SEAS 202 Southeast Asian religions
- SEAS 203 Southeast Asian cultures
- SEAS 204 History of Southeast Asia
- SEAS 205 Literatures of Southeast Asia
- SEAS 206 Media in Southeast Asia

In addition, students can select four other graduate seminars or approved upper division undergraduate courses in accordance with their main field of interest and after approval by the Graduate Advisor and the student's Thesis Committee. A total of 48 units of coursework, including thesis, are required for the degree in Southeast Asian Studies.

Students concurrently enrolled in another graduate program may, when appropriate, include units earned in that program toward the 48 units of the M.A. in Southeast Asian Studies. However, there must be at least 36 units uniquely applied to the Southeast Asian Studies degree.

**Plan I (Thesis)** Students enrolled in the Southeast Asian Studies Graduate Program (for the terminal M.A.) must submit an essay (thesis) of 30-40 pages reflecting original research, written under the supervision of a member of the program who also functions as the chair of their Thesis Committee. At the beginning of the second year students should write a research proposal outlining their research project. Approximately ten pages in length this proposal should describe the aims of the research and provide a broader theoretical framework. After this is approved students begin to conduct individual research in the field or in the library. Students must enroll in a minimum of 8 units of thesis study under the supervision of a Southeast Asian Studies faculty. Before filing the thesis with the Graduate Division students must pass a formal oral examination.

### Plan II (Comprehensive Exam)

Students concurrently enrolled in another degree program requiring an M.A. thesis may (with the approval of the Southeast Asian Studies faculty) be awarded the M.A. degree by passing a comprehensive examination.

### University Requirements

All master's students must be enrolled for at least three quarters to fulfill the University residency requirement and must hold at least a 3.00 GPA in all upper division and graduate level course work related to the degree. A minimum of 48 units must be completed of which 36 must be graduate level (200 level) or approved upper division undergraduate (100 level) and apply only to the M.A. in Southeast Asian Studies.

**Normative Time to Degree** Two years

## Lower-Division Courses

### SEAS 047. Introduction to Southeast Asian History (4)

Lecture, 3 hours; extra reading, 3 hours. Introduces major themes and events in Southeast Asian history. Covers from prehistory to contemporary events in the region. Develops basic historical approaches to understanding contemporary trends, such as the spread of world religions, regional differences and connections, trading patterns, cultural forms, and historically important sites. Cross-listed with AST 049 and HIST 046.

## Upper-Division Courses

### SEAS 145. Buddhism in Southeast Asia (4)

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): RLST 106 or consent of instructor. Explores various texts, magical practices, forms of meditation, rituals, and beliefs of ancient and modern Buddhism, focusing on the ways in which they are transformed by nuns, monks, and the laity in Burma, Cambodia, Laos, Thailand, and California. Cross-listed with RLST 145.

### SEAS 162. Vietnamese Literary History (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with AST 162, HIST 187, and VNM 162.

### SEAS 184. The Vietnam Wars (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Vietnamese history in the twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-*dai moi* society. Cross-listed with AST 160, HIST 184, and VNM 184.

### SEAS 185. Southeast Asia, Prehistory to 1800 (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers the major Southeast Asian historical periods and cultures. Includes prehistory, classical kingdoms, and early modern trading states. Considers the role of ancient stories, religious systems, technologies, and art forms in forming traditional Southeast Asian identities, as well as the influences on these identities from outside the region. Cross-listed with AST 126 and HIST 185.

### SEAS 186. Modern Southeast Asia, 1800 to Present (4)

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the formation of modern Southeast Asian nations and cultures since 1800. Compares colonial and postcolonial experiences in the region. Studies the formation of nationalist movements and the relationship of nationalist history with traditional and local histories. Considers the role of the individual, modern media, and global trade in the near-present. Cross-listed with AST 129 and HIST 186.

### SEAS 189. Encountering Vietnam (5)

Lecture, 6 hours; tutorial, 6 hours; project, 6 hours. Prerequisite(s): upper-division standing or consent of instructor.

Focuses on literary and historical accounts of Vietnam. Utilizes translated travel writings from different genres and eras. Proficiency in Vietnamese not required. Taught in Vietnam and offered only in summer. Cross-listed with AST 189, HIST 189, and VNM 189.

## Graduate Courses

### SEAS 200. Topics in Southeast Asian Studies (4)

Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the world of Southeast Asia and the scholarly discussions about it, with an emphasis on cultural aspects, embedded in their historical context. Materials are in English. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPLT 200.

**SEAS 202. Southeast Asian Religions (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses different and dynamic aspects of religion in various Southeast Asian countries, including Indonesia, Malaysia, Thailand, Cambodia, Vietnam, and the Philippines. Explores contextualized readings featuring historical, anthropological, literary, and other disciplinary perspectives on this diverse region. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topic changes up to 8 units.

**SEAS 203. Southeast Asian Cultures (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys ethnographic literature on Southeast Asian cultures, with an emphasis on contemporary research. Covers anthropological approaches to the study of text, ritual, and performance practices; intercultural dynamics; the impact of colonialism and nationalism on traditional cultures; and globalization. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ANTH 203.

### SEAS 204. Approaches to Southeast Asian History (4)

Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to central historical problems, historiographical debates, materials, and theoretical approaches in Southeast Asian history. Readings each week focus on a different theme. Course is repeatable to a maximum of 8 units. Cross-listed with HIST 242.

### SEAS 205. Literature of Southeast Asia (4)

Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores themes and theories related to understanding literature and literary culture in Southeast Asia, insisting that the space of literature reaches beyond the text to include all disciplines. Students critically read, engage in, and question discourses of nationhood, identity, loss, mourning, history, and memoir. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPLT 205.

### SEAS 206. Southeast Asian Diasporic Literature and Film (4)

Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the contemporary works by Southeast Asian immigrants within the United States and France. Emphasizes the concept that the dynamic production of culture is a negotiation of power and an expression of resistance. Provides an interdisciplinary framework by utilizing historical as well as theoretical works to contextualize the cultural productions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

### SEAS 243A. Seminar in Southeast Asian History (4)

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses Southeast Asian topics from regional, comparative, and local perspectives. May be undertaken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned. After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with HIST 243A.

### SEAS 243B. Seminar in Southeast Asian History (4)

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 243A/SEAS 243A. Discusses Southeast Asian topics from regional, comparative, and local perspectives. Students produce a substantial research paper that continues their work from HIST 243A/SEAS 243A. May be undertaken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with HIST 243B.

**SEAS 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor. Directed study to meet special curricular needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

### SEAS 292. Concurrent Analytical Studies in Southeast Asian Studies (1-4)

Individual study, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Taken concurrently with a 100-series course, but on an individual basis. Devoted to research, criticism, and written work at the graduate level related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SEAS 297. Directed Research (1-6)** Outside research, 3-18 hours. Prerequisite(s): consent of instructor; graduate standing. Individualized research under the sponsorship of specific faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

### SEAS 299. Research for the Thesis (1-12)

Thesis, 3-36 hours. Prerequisite(s): consent of thesis director. Research and preparation for the thesis. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Statistics

### Subject abbreviation: STAT College of Natural and Agricultural Sciences

Daniel R. Jeske, Ph.D., Chair  
Department Office  
1337 Olmsted Hall  
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CNAS Undergraduate Advising Center  
1223 Pierce Hall

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### Professors

Barry C. Arnold, Ph.D.  
Subir Ghosh, Ph.D.  
Daniel R. Jeske, Ph.D.  
Keh-Shin Lii, Ph.D.

### Professors Emeriti

Robert J. Beaver, Ph.D.  
D. V. Gokhale, Ph.D.  
S. James Press, Ph.D.  
Christopher A. Robertson, Ph.D.  
David J. Strauss, Ph.D.

### Associate Professor

Xinping Cui, Ph.D.

### Assistant Professors

James M. Flegal, Ph.D.  
Jun Li, Ph.D.  
Shujie Ma, Ph.D.

\*\*

### Lecturers

Analisa Flores, Ph.D.  
Linda M. Penas, Ph.D.  
Jill Smith, M.S.

### Lecturer Emerita

Barbara Beaver, M.S.

## Major

The Department of Statistics is concerned with teaching, research, and statistical consulting. The courses offered present a comprehensive spectrum of statistical and probability theory, in so far as such theory is necessary for the understanding and analysis of observational data. The applications of the theory delineated in the courses may be made in any field of experience. Laboratory classes in which examples related to the student's actual field of interest are worked out, play an essential part. The department offers both B.A. and B.S. degrees in Statistics as well as a B.S. in Statistics with options in Statistical Computing and Quantitative Management; the M.S. degree in Statistics; and the Ph.D. degree in Applied Statistics.

The courses STAT 040, STAT 048, STAT 100A, STAT 100B, STAT 104/BUS 104, STAT 110, STAT 130, STAT 140, STAT 146, and STAT 155 are intended for students of other departments who wish a knowledge of statistical techniques. Some of them may be taken as electives by statistics majors. The objective of these courses is to acquaint the student with the elements of statistics with only the necessary amount of mathematical training.

STAT 147 and STAT 157 are computer-oriented courses intended for students who would like to learn about computer programming in the most important languages and who would like to learn about statistical computing.

In addition to teaching, the Department of Statistics is responsible to the dean of the College of Natural and Agricultural Sciences and director of the Agricultural Experiment Station for collaboration with research workers in the biological and agricultural fields. A consultative service in the design, analysis, and interpretation of experimental data relating to the agricultural sciences is provided.

## Computing Laboratories

The Department of Statistics has a strong applied orientation that involves the use of statistical computing while solving real world problems that arise in many disciplines. The department has two interactive multimedia computer laboratories with a SUN Microsystems Netra server and Pentium-class clients, and a third UNIX-based laboratory that contains multiple SUN Microsystems Blade and Ultra 24 workstations. Each of the labs provides users access to a wide variety of statistical software packages and are connected to the Internet and the campus WiFi network. The CRAY Supercomputer at the San Diego Supercomputer Center (SDSC) is also available to faculty and graduate students, as are the 30 PC workstations in a computing laboratory that is maintained by the Statistical Consulting Collaboratory.

## Statistical Consulting Center

The Statistical Consulting Collaboratory provides a broad range of analytical and statistical support services, including design of experiments, statistical inference, hypothesis testing, and data modeling for the campus community, and promotes cooperative research between statisticians and other investigators in all fields of the application of statistics. The Collaboratory is staffed by:

**Daniel R. Jeske, Ph.D., Faculty Director**  
**Karen Huaying Xu, Ph.D., Associate Director**

and rotating graduate students.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

## Major Requirements

The department offers both a B.A. and a B.S. degree in Statistics as well as a B.S. in Statistics with options in Statistical Computing and Quantitative Management.

The major requirements for the B.A. and the B.S. degrees in Statistics are as follows:

### For the Bachelor of Arts

1. Core requirements (24–25 units)
  - a) CS 010, MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A
  - b) Four (4) additional units in Mathematics, chosen from MATH 113 or MATH 131
2. Upper-division requirements
  - a) Thirty-six (36) units of upper-division course work
    - (1) STAT 147, STAT 155, STAT 157, STAT 170A, STAT 170B
    - (2) Twelve (12) units chosen from STAT 127/BUS 127, STAT 130, STAT 140, STAT 146, STAT 160A, STAT 160B, STAT 160C, STAT 171
    - (3) Four (4) units of STAT 183 taken during Senior year
  - b) Sixteen (16) units of additional course work chosen, with the approval of the major advisor, from Statistics courses numbered 104 and higher or from related fields.

- STAT 170A, STAT 170B
- (2) Twelve (12) units chosen from STAT 127/BUS 127, STAT 130, STAT 140, STAT 146, STAT 160A, STAT 160B, STAT 160C, STAT 171
- (3) Four (4) units of STAT 183 taken during Senior year

**Note** An introductory Statistics class such as STAT 048, or STAT 100A is strongly recommended.

### For the Bachelor of Science

1. Core requirements (24–25 units)
  - a) CS 010, MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A
  - b) Four (4) additional units in Mathematics, chosen from MATH 113 or MATH 131
2. Upper-division requirements (52 units)
  - a) Thirty-six (36) units of upper-division course work
    - (1) STAT 147, STAT 155, STAT 157, STAT 170A, STAT 170B
    - (2) Twelve (12) units chosen from STAT 127/BUS 127, STAT 130, STAT 140, STAT 146, STAT 160A, STAT 160B, STAT 160C, STAT 171
    - (3) Four (4) units of STAT 183 taken during Senior year
  - b) Sixteen (16) units of additional course work chosen, with the approval of the major advisor, from Statistics courses numbered 104 and higher or from related fields.

**Note** An introductory Statistics class such as STAT 048, or STAT 100A is strongly recommended.

### Statistical Computing Option

The requirements for this option are in addition to the requirements for the B.S. in Statistics, except that the option requirement takes the place of the 16 units in 2.b) above.

1. Lower-division requirements (8 units): CS 012, CS 014
2. Upper-division requirements (16 units)
  - a) MATH 113
  - b) Twelve (12) units of course work selected from
    - (1) CS 141, CS 177
    - (2) MATH 112, MATH 120
    - (3) STAT 198-I
  - c) MATH 135A, MATH 135B recommended

### Quantitative Management Option

The requirements for this option are in addition to the requirements for the B.S. in Statistics, except that the option requirement takes the place of the 16 units in 2.b) above.

1. Lower-division requirements (16–17 units)
  - a) ECON 003
  - b) BUS 010, BUS 020, BUS 021

2. Upper-division requirements (16 units)
  - a) MATH 113
  - b) Three courses from one area
    - (1) Marketing: BUS 103, BUS 113, BUS 117
    - (2) Finance: BUS 106/ECON 134, BUS 134, BUS 135, BUS 136, BUS 138
    - (3) Accounting: BUS 108, BUS 165A, BUS 165B, BUS 168A, BUS 168B
    - (4) Management Information Systems: BUS 101, BUS 171, BUS 173

## Minor

The minor in Applied Statistics is designed to give students in either the social sciences or the physical sciences a cohesive set of statistics courses to deal with the data analytic aspects of their disciplines and to understand the statistical summaries that are encountered in everyday activities.

The requirements for the minor consist of at least 24 and not more than 28 upper-division units in Statistics to include the following:

1. STAT 100A, STAT 100B
2. Eight (8) units from STAT 110, STAT 127/BUS 127, STAT 130, STAT 140, STAT 146
3. Four (4) units from STAT 147, STAT 157
4. Four (4) additional units from 2. or 3. above

Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements.

No more than 4 units may be in courses numbered 190 through 199.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Graduate Programs

The Department of Statistics offers the M.S. degree in Statistics and the Ph.D. degree in Applied Statistics.

**Admission** Domestic and international applicants must supply scores from the GRE general exam. In addition, TOEFL scores must be supplied by all applicants whose first language is not English. The department considers applications for teaching assistantships at the same time as those for fellowships. Normally, applications for fellowships are awarded by February or March for students admitted for the following Fall quarter.

## Master's Program

The Department of Statistics offers the M.S. degree in Statistics.

**Admission** Students entering the Master's program must have completed a bachelor's degree with a strong background in Statistics

and sufficient training in Mathematics or take STAT 160A, STAT 160B, STAT 160C, STAT 161 and STAT 170A, STAT 170B, STAT 171, covering basic areas of probability and statistics. These courses would not be counted as credit towards the master's degree.

Students must also meet the other requirements for admission as specified by the Graduate Division. The program is Plan II (Comprehensive Examination) described in the Graduate Studies section of this catalog. No foreign language is required.

**Course Work** Graduate students in Statistics must take (or have taken) appropriate courses in Mathematics to give them the proper background for graduate work in Statistics. Important areas include Calculus (at least MATH 008B or MATH 009A, MATH 009B, MATH 009C, and MATH 010A) and Linear Algebra (at least MATH 131). Students are strongly encouraged to take at least one of the following: MATH 120 (Optimization), MATH 126 (Combinatorics), MATH 135A, MATH 135B (Numerical Analysis), MATH 151A, MATH 151B, MATH 151C (Advanced Calculus), MATH 165A, MATH 165B (Complex Variables), and MATH 209A, MATH 209B, MATH 209C (Real Analysis). The specific courses selected naturally depend on the research area selected by the student.

The program consists of a minimum of 36 approved units. These must include 1 unit of STAT 288; 12 units of STAT 293 are counted toward this total. In addition, at least 20 units must be from STAT 200A, STAT 200B, STAT 203A, STAT 203B, STAT 205, STAT 207A, STAT 207B, STAT 210A, STAT 210B, STAT 210C, STAT 215, STAT 216A, STAT 216B, STAT 220A, STAT 220B, STAT 230, STAT 240.

Knowledge of at least one computer language and the use of statistical computer packages is required, and students lacking this background should take STAT 157.

Early in the program the student submits a program proposal, which requires the approval of the M.S. advisor. The advisor also supervises the student's progress and course of study.

**Comprehensive Examination** After completion of the required courses, the student takes a written comprehensive examination. This is generally offered twice annually, in the fall and spring quarters.

**Petition to Change Degree Objective** Some students can petition to change their degree objective from the M.S. degree to the Ph.D. program in Applied Statistics depending on their performances in the written comprehensive exam and coursework.

## Doctoral Degree

The Department of Statistics offers the Ph.D. degree in Applied Statistics.

The program emphasizes both the theory of statistics and its application to special fields of interest. In addition to courses in statistics, a

student would take courses in a substantive field from which a thesis problem requiring a statistical approach should arise. The substantive field may be chosen from areas such as biology, economics, political science, psychology or administration. Specialties might include, for example, population genetics, biological control, hydrology, epidemiology, geology, discrimination in learning, or scales and measurements.

**Admission** Students entering the program must have completed either a bachelor's degree or a Master's degree in Statistics, Computer Science, Mathematics, or some other quantitatively based discipline. Students lacking sufficient preparation for some statistics graduate classes must complete some preparatory work in Statistics, Computer Science, or Mathematics depending on their background. Students also have to meet the general requirements listed in the Graduate Studies section of this catalog.

**Change Degree Objective** Students with a Bachelor's degree in the Ph.D. program who have satisfied all the requirements for the Master's degree may apply for this degree while completing requirements for the Ph.D. program.

### Ph.D. Course Requirements

#### I. Course Requirements

(A) Core: STAT 210A, STAT 210B, STAT 210C, three quarters of STAT 293 and one quarter of STAT 288.

(B) Additional: four statistics 200 level courses not graded S/NC.

(C) Breath: three breath requirements selected from STAT 200A, STAT 203A, STAT 215, STAT 216A, STAT 220A.

(D) Substantive: Twelve units (or equivalent) in a Substantive Field with a minimum GPA of 3.00 appropriate to the student's interest. The requirement may be waived if the student already has the background in the substantive area.

(E) Computer: Knowledge of at least one computer language and the use of statistical computer packages; students lacking this background should take STAT 157.

II. Teaching: At least three quarters of teaching service.

III. Miscellaneous: In preparation for the written qualifying examinations, a student can register for up to 6 units of STAT 291 (Individual Studies in Coordinated Areas) only during quarters that the student actually participates in qualifying examinations.

**Foreign Language Requirement** None

**Qualifying Examination** The written Part 1 & Part 2 are offered twice annually, in the fall and spring quarters. After passing the written exams the student will work with advisor to prepare for the Oral examination. Advancing to Candidacy takes place when students complete all the course requirements for the Ph.D. program and passes the written and oral exams.

We expect students to complete the qualifying exams before the beginning of the third year.

**Dissertation** The dissertation is pertinent to a problem area specified by the candidate's substantive field and is submitted in accordance with the requirements of the Graduate Division, Riverside.

**Teaching Requirement** All students in the program, for at least three quarters, assist with laboratory (practice) sections of undergraduate Statistics courses or individual tutorial (consultative) work with undergraduate students.

**Normative Time to Degree** 15 quarters

## Lower-Division Courses

**STAT 040. Elements of Statistics (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A Bayesian introduction to statistics. Advocates that estimates, hypothesis tests, and decisions be made from information developed from a formal combination of current and prior data. Topics include summarizing and displaying data; designing experiments; probability; Bayes' rule; inferences from proportions and normal populations; sampling; and regression analysis. Utilizes Minitab. Credit is not awarded for STAT 040 if it has already been awarded for STAT 048, STAT 100A, or STAT 100B.

**STAT 048. Statistics for Business (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 008 or equivalent; MATH 004 or MATH 005 or MATH 008A or MATH 009A or MATH 9HA or equivalent. An introduction to statistics using business applications. Topics include descriptive statistics, probability, discrete and continuous distributions, Bayes' theorem, random variables, estimation and confidence intervals, hypothesis testing, analysis of variance, and simple linear regression. Credit is awarded for only one of STAT 048 or STAT 100A.

## Upper-Division Courses

**STAT 100A. Introduction to Statistics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 005 or MATH 008A or MATH 009A or MATH 09HA or equivalent. A general introduction to descriptive and inferential statistics. Topics include histograms; descriptive statistics; probability; normal, binomial, and Poisson distributions; sampling distributions; hypothesis testing; and confidence intervals. Credit is awarded for only one of STAT 048 or STAT 100A.

**STAT 100B. Introduction to Statistics (5)** Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): STAT 100A. An introduction to inferential statistics. Topics include linear regression, correlation, analysis of variance, nonparametric methods, and simple experimental designs.

**STAT 104. Decision Analysis and Management Science (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 008 or equivalent; STAT 048 or STAT 100A or equivalent; upper-division standing. A survey of deterministic and probabilistic models for decision making. Topics include linear programming and extensions, networks, dynamic programming, decision trees, queuing models, and simulation. Explores the application of these models in decision making. Emphasizes use of the computer. Cross-listed with BUS 104.

**STAT 110. Biostatistical Methods in Life Sciences (5)**

Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): STAT 100B or consent of instructor. Provides undergraduate students majoring or interested in life sciences with statistical tools for analyzing different types of data frequently encountered in life sciences. Emphasizes applications of methodology, including contingency table analysis, linear regression and ANOVA, maximum likelihood method and the estimation-maximization algorithm, logistic regression, Poisson regression, and survival analysis.

**STAT 127. Introduction to Quality Improvements (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 048 or STAT 100A or consent of instructor. Explores Deming's 14 points for management, graphical methods, fishbone diagram, Pareto analysis, control charts for attributes and variables, cusum and moving average charts, process-capability, economic design, acceptance sampling, Taguchi method, parameter design, tolerance design, reliability, hazard rate, censoring, and accelerated life testing. Cross-listed with BUS 127.

**STAT 130. Sampling Surveys (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100A, STAT 100B, or equivalents. Simple random sampling. Stratified sampling. Cluster sampling. Ratio and regression estimates. Random response, capture-recapture and jack-knife techniques.

**STAT 140. Nonparametric Techniques (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100B or equivalent. Covers randomization tests, rank tests, methods of association, and distribution-free tests.

**STAT 146. Statistical Forecasting Techniques (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100B or equivalent. Topics include exponential smoothing, simple and multiple regression analysis, time series, trend analysis, and seasonal analysis.

**STAT 147. Introduction to Statistical Computing (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 040 or equivalent. Introduction to computer-assisted data analysis and statistical inference using both the MINITAB and SAS packages. Topics include input, output, and editing of data; graphical procedures; descriptive statistics; cross-tabulation; inferential statistical techniques including estimation and testing; regression; and analysis of variance.

**STAT 155. Probability and Statistics for Science and Engineering (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC (MATH 009C or MATH 09HC may be taken concurrently). Covers sample spaces and probability; random variables and probability distributions; elements of statistical inference; and testing and estimation. Also addresses selected topics in multivariate distributions and introduces stochastic processes.

**STAT 157. Statistical Computer Packages (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100A, STAT 100B, or equivalents; STAT 147; or consent of instructor. A study of major statistical packages, including SAS and BMPD with the emphasis on advanced SAS programming. Topics include advanced graphical procedures, linear models (regression and analysis of variance), multivariate techniques, and SAS macros.

**STAT 160A. Elements of Probability and Statistical Theory (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC (may be taken concurrently). Topics include statistical regularity, probability spaces, fundamental theorems in discrete probability, Bayes' theorem, random variables, densities and distribution functions, continuous distri-

butions, transformations of random variables, and central limit theorem. Credit is awarded for only one of MATH 149A or STAT 160A.

**STAT 160B. Elements of Probability and Statistical Theory (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A. Topics include distributions of sample statistics, statistical inference, and estimation. Credit is awarded for only one of MATH 149B or STAT 160B.

**STAT 160C. Elements of Probability and Statistical Theory (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160B. Topics include hypothesis testing, chi-square tests, and nonparametric methods. Credit is awarded for only one of MATH 149C or STAT 160C.

**STAT 161. Introduction to Probability Models (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A and STAT 160B, or equivalent. Compound distributions. Branching processes. Random walk. Continuous time models; Poisson process, queuing models. The Markov property. Introduction to Markov chains. Simple time series models.

**STAT 170A. Regression Analysis (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 147, STAT 155, STAT 157, or equivalents. Topics include simple and multiple linear regression; scatter-plots; point and interval estimation; prediction; testing; calibration; interpretation and practical applications of multiple regression; simple, partial, and multiple correlation; variable selection methods; diagnostic procedures; and regression for longitudinal data.

**STAT 170B. Design of Experiments (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170A. Topics include principles of design; completely randomized designs and one-way analysis of variance; complete block designs and two-way analysis of variance; multiple comparisons; complete factorial experiments; fixed, random, and mixed models; split-plot designs; nested designs; analysis of covariance; sample size determination and power analysis.

**STAT 171. General Statistical Models (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170B. Generalized linear models and least squares. Analysis of covariance, nonlinear regression, nonlinear least squares. Regression methods for discrete data: log-linear models, logistic regression, discriminant analysis. Regression methods for life data. Cox survival model, Kaplan-Meier estimation, Mantel-Haenszel test.

**STAT 183. Statistical Consulting (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 147, STAT 155, STAT 157, STAT 170B, STAT 171; senior standing. Introduces students to the statistical consulting process. Promotes consulting skills, including developing effective communication skills, applying statistical methodology to client projects, and learning how to manage time and resources in a consulting environment. Satisfactory (S) or No Credit (NC) grading is not available.

**STAT 190. Special Studies (1-5)**

hours to be arranged. To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 10 units.

**STAT 197. Research for Undergraduates (2-4)**

Outside research, 3-6 hours; individual study, 3-6 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to research in Statistics. Requires a research project completed under the supervision of a Statistics faculty member or a group of faculty members. Students who make an oral presentation of the research project or submit a written research report receive a letter grade; other students

receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as research topic changes to a maximum of 8 units.

**STAT 198-I. Individual Internship in Statistics (1-12)**

Internship, 2-24 hours; outside research, 1-12 hours. Prerequisite(s): STAT 100B, consent of instructor, upper-division standing. An internship to provide statistical field experience in governmental, industrial, or research units. Projects must be approved by the Statistics Department and the head of the unit in which the internship is to be carried out. Requires a written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units, but total credit toward graduation may not exceed 12 units.

**STAT 199H. Senior Honors Research (1-5)**

Prerequisite(s): senior standing with major concentration in statistics and with consent of instructor. Senior standing with major concentration in statistics and with consent of instructor. Course is repeatable to a maximum of 10 units.

## Graduate Courses

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**STAT 200A. Advanced Design and Analysis of Experiments (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170A, STAT 170B, STAT 171, or equivalents. Topics include fixed, mixed, and random effects models; complete and incomplete block designs; row-column designs; nested designs; split-plot designs; crossover designs; analysis of covariance; repeated measure designs; and optimality of designs.

**STAT 200B. Advanced Design and Analysis of Experiments (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170A, STAT 170B, STAT 171, or equivalents; STAT 200A. Topics include factorial experiments; confounding and fractional factorial experiments for symmetrical and asymmetrical factorial experiments; orthogonal and balanced arrays; optimal fractional factorial designs; first and second order response surface designs; rotatability; and blocking of response surface designs; method of steepest ascent; canonical representation; and minimum bias, variance, and mean square error designs.

**STAT 203A. Bayesian Statistics I (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C or equivalent. Subjective probability, Renyi axiom system, Savage axioms, coherence, Bayes theorem, credibility intervals, Lindley paradox, empirical Bayes estimation, natural conjugate priors, de Finetti's theorem, approximation methods, Bayesian bootstrap, Bayesian computer programs.

**STAT 203B. Bayesian Statistics II (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 203A. Assessing priors, nonparametric density estimation for expert group judgements, Bayesian regression, Bayesian analysis of variance, Bayesian regression with correlated disturbances and heteroscedasticity, Bayesian inference in time series models, Bayesian classification, Bayesian inference in spatial statistics, Bayesian factor analysis, disputed authorship.

**STAT 205. Discrete Data Analysis (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C or equivalents; or consent of instructor. Contingency tables, log-linear models, information theory models, maximum likelihood estimation, goodness of fit, measures of association, computational procedures.

**STAT 207A. Statistical Computing (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, STAT 170A, STAT 170B; or con-

sent of instructor. Topics include computational aspects of least squares in linear statistical models, optimization in nonlinear statistical models, numerical accuracy and error analysis, simulations and Monte Carlo methods for problems in statistical inference, pseudorandom numbers, and numerical approximations.

**STAT 207B. Statistical Computing (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, STAT 170A, STAT 170B; or consent of instructor. Topics include resampling methods, expectation maximization (EM) algorithm, Markov chain and Monte Carlo methods, and other current computational methods.

**STAT 209A. Statistical Data Mining (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 170A; or consent of the instructor. Introduces principal data-mining methodologies, major software tools, and typical applications for structuring, understanding, and using large datasets effectively and efficiently.

**STAT 209B. Statistical Data Mining (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 209A; or consent of instructor. Introduces principle data-mining methodologies, major software tools, and typical applications for structuring, understanding, and using large datasets effectively and efficiently.

**STAT 210A. Theoretical Statistics and Probability (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B, STAT 160C, or equivalents. Topics include conditional probability, independence, distribution functions, generating functions, convergence concepts, limit theorems, and order statistics.

**STAT 210B. Theoretical Statistics and Probability (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 210A. Topics include estimation, decision theory, Bayes and empirical Bayes rules, and efficiency.

**STAT 210C. Theoretical Statistics and Probability (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 210B. Topics include hypothesis testing, sequential inference, distributions, and free and robust techniques.

**STAT 215. Stochastic Processes (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, STAT 161. The Markov property; Markov chains; Markov processes and Poisson processes. Birth and death models. Queues. Random walks. Renewal processes. Wiener processes and diffusion.

**STAT 216A. Time Series Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, STAT 161, or equivalents. Topics include stationary processes, autoregressive—moving average (ARIMA) processes, trend, seasonality, model building, estimation and forecasting, and spectral analysis and estimation.

**STAT 216B. Time Series Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 216A or consent of instructor. Topics include spectral analysis and estimation, higher-order spectral analysis, Kalman filtering and prediction, and nonlinear, nonstationary, and non-Gaussian time series.

**STAT 220A. Multivariate Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, or equivalents; familiarity with matrix algebra. Topics include algebra and calculus of vectors and matrices, special multivariate distributions (Normal, Wishart, Hotelling's T-squared, multivariate T, multivariate log-normal, etc).

**STAT 220B. Multivariate Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 220A or consent of instructor. Topics include categorical dependent variable regression, loglinear models, inference in the multivariate normal distribution, multivariate multiple regression, hypothesis testing, likelihood ratio tests, multivariate analysis of variance and covariance, principal components analysis, factor analysis, and classification and discrimination models.

**STAT 230. Sampling Theory (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C. Covers the theory of stratified, ratio, and regression methods of estimation and cluster and double sampling. Includes the concept of sufficiency and its applications from finite populations, nonsampling errors, estimation of response bias and of optimum number of interviewers, and sampling inspection.

**STAT 231A. Statistics for Biological Sciences (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100B or equivalent or consent of instructor; graduate standing in Biochemistry and Molecular Biology; Biomedical Sciences; Botany; Cell, Molecular, and Developmental Biology; Entomology; Environmental Toxicology; Genetics, Genomics, & Bioinformatics; Evolution, Ecology, and Organismal Biology; Microbiology; Nematology; Neuroscience; Plant Biology; Plant Genetics; Plant Pathology; Plant Science. Covers one- and two-sample tests, one- and two-way analysis of variance, multiple comparison, simple and multiple linear regression, nonparametric statistics, and categorical data.

**STAT 231B. Statistics for Biological Sciences (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 113, MATH 131, or equivalent; STAT 231A or consent of instructor; graduate standing in Biochemistry and Molecular Biology; Biomedical Sciences; Botany; Cell, Molecular, and Developmental Biology; Entomology; Environmental Toxicology; Genetics, Genomics, & Bioinformatics; Evolution, Ecology, and Organismal Biology; Microbiology; Nematology; Neuroscience; Plant Biology; Plant Genetics; Plant Pathology; or Plant Science. Covers logistic regression, analysis of covariance, advanced experimental designs, randomization, bootstrapping, jackknifing, and other procedures.

**STAT 240. Nonparametric Methods (4)** Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C. Theory of distribution-free statistics, ranking statistics, rank correlation, U-statistics. Nonparametric point and interval estimation. Empirical distribution function methods. Combinatorial problems; runs, matching, occupancy; limiting distributions.

**STAT 251. Statistics Colloquium (1)** Colloquium, 1.5 hours. Prerequisite(s): consent of instructor. Presentation of current research in statistics by faculty, advanced graduate students, and guest lecturers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**STAT 255 (E-Z). Seminar on Topics in Applied Statistics (3-4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Additional prerequisites are required for some segments of this course; see department. Discussions and lectures by graduate students and faculty on topics related to student and faculty research. In some courses students will receive letter grades only. In others students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade; no petition is required, but students must see instructor for grading basis. The department will maintain a listing of all 255 segments and their unit value and grading basis. Normally graded Satisfactory

(S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination.

**STAT 288. Literature Seminar (1)** Seminar, 1 hour. Students will make oral presentations summarizing important research papers in the statistics literature. All graduate students are encouraged to participate. Topics may vary each term. Graded Satisfactory (S) or No Credit (NC).

**STAT 290. Directed Studies (1-6)** Prerequisite(s): graduate standing and consent of instructor. Individual studies on specially selected topics in statistical applications. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**STAT 291. Individual Studies in Coordinated Areas (1-6)** Consultation, 1-6 hours. Prerequisite(s): graduate standing. A program of studies designed to assist candidates who are preparing for examinations. Open to M.S. and Ph.D. students; does not count toward the unit requirement for the M.S. degree. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**STAT 292. Concurrent Analytical Studies (1-4)** Outside research, 3-12 hours. Prerequisite(s): consent of instructor and concurrent enrollment in 100-series course. To be taken on an individual basis. Student will complete a graduate paper related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

**STAT 293. Statistical Consulting and Data Analysis (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C, STAT 170B, STAT 171; or consent of instructor. Covers statistical consulting and analysis of client data, the client-consultant meeting, negotiations, communications, interactions, and skills that facilitate the process of self-learning. Involves client visitations and field trips. Students present written and oral reports and technical talks. Statistics graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 12 units.

**STAT 297. Directed Research (1-6)** Prerequisite(s): graduate standing and consent of instructor. Directed research in applications of statistics in biological studies, including computer simulation. Graded Satisfactory (S) or No Credit (NC).

**STAT 299. Research for Thesis or Dissertation (1-12)** Prerequisite(s): graduate standing and consent of instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Professional Course

**STAT 302. College Teaching Practicum (1-4)** Practicum, 3-12 hours. Prerequisite(s): graduate standing and consent of instructor. Required of all teaching assistants in the department. Credit not applicable to graduate unit requirements. Supervised teaching in college level classes under the supervision of the course instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

# Theatre

**Subject abbreviation: THEA**

**College of Humanities, Arts, and Social Sciences**

D. Eric Barr, M.F.A., Chair  
Department Office, 121 Arts  
(951) 827-5568; [theatre.ucr.edu](http://theatre.ucr.edu)

## Professors

D. Eric Barr, M.F.A.  
Richard Hornby, Ph.D.  
Stuart Krieger, B.A.  
Haibo Yu, M.F.A.

## Professor Emeritus

Richard D. Rizzo, Ph.D.

## Associate Professors

Charles Evered, M.F.A.  
Rickerby Hinds, M.F.A.  
Erith Jaffe-Berg, Ph.D.  
Tiffany Lopez, Ph.D.  
Robin Russin, M.F.A.

## Assistant Professor

Keun-Pyo Park, M.F.A.

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## Lecturers

Kathryn Anger, M.F.A.  
Glen Dunzweiler, M.F.A.  
Marc L. Longlois, M.F.A.

## Major

The Department of Theatre offers a B.A. in Theatre. The major focuses on three broad areas of theatre — its literature, history, and criticism; performance, design, direction, and technology; and the elements of production. Students have the opportunity to write, perform, direct, and design. Four stages are available for rehearsals and performances: the 500-seat proscenium University Theatre, the new 150-seat Studio Theatre in the Arts building with state-of-the-moment equipment for facilities, the 120-seat Rehearsal Lab, and the 50-seat Barn Theatre.

Students are able to practice acting in faculty-directed shows, student productions, and class presentations. Special projects and studies are offered for advanced students to produce an original work or to study in more depth acting, directing, scenic design, or playwriting.

As part of the Theatre Department's ongoing goal to provide a comprehensive and world-class program in the performing arts, a new **Film Making Track** has been created for students who are primarily interested in pursuing the goal of becoming filmmakers. In addition to taking classes in filmmaking, screenwriting, acting, and technology, students will also take classes in literature and theory as requirements rather than having to fit them in as often unavailable electives.

Student assistantships, work-study, Gluck Fellowships, and scholarships such as the Chancellor's Performance Award are available to students. For further information or a department tour, call the Theatre Department, (951) 827-3343.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Theatre are as follows:

### Track 1: General Theatre

Upper-division requirements (64 units)

- Literature, History, Criticism requirement
  - THEA 100, THEA 120A, THEA 120B, THEA 120C
  - Twelve (12) units from THEA 121, THEA 122, THEA 124A, THEA 124B, THEA 125 (E-Z), THEA 126A, THEA 126B, THEA 127, THEA 191 (E-Z), or any other course in dramatic literature approved by the Chair
- Performance, Direction, Playwriting, Screenwriting, Design, and Theatre Technology requirement
  - THEA 101, THEA 102, THEA 109
  - Twelve (12) units from THEA 110A, THEA 110B, THEA 111A, THEA 111B, THEA 112E, THEA 113 (E-Z), THEA 132, THEA 133, THEA 135, THEA 141, THEA 142, THEA 143, THEA 144, THEA 145, THEA 150A, THEA 150B, THEA 164A/CRWT 164A, THEA 164B/CRWT 164B, THEA 164C/CRWT 164C, THEA 166A, THEA 166B, THEA 166C, THEA 176/ANTH 128/AST 128/ DNCE 128/MUS 128, THEA 180 (E-Z)
- Production requirement

Twelve (12) units of THEA 170 with two (2) units from each of the following areas: sets, costumes, and lighting/sound. Six of these units must be taken in residence.

### Track 2: Writing for the Performing Arts

Upper-division requirements (66 units)

- THEA 100, THEA 101, THEA 109, THEA 170 (2 units)
- Literature, History, Criticism (16) units from CPLT 146, CPLT 149, ENGL 117A, ENGL 117B, ENGL 117C, ENGL 117T, ENGL 129A, ENGL 129B, ENGL 129C, THEA 120A, THEA 120B, THEA 120C, THEA 121
- Performance, Playwriting, Screenwriting, Production (24) units from THEA 164A, THEA 164B, THEA 164C, THEA 166A, THEA 166B, THEA 166C
- Twelve (12) additional units from CRWT 172, THEA 110A, THEA 110B, THEA 114, THEA 150A, THEA 150B, THEA 163, THEA 165A/CRWT 167A, THEA 165B/CRWT 167B, THEA 167, THEA 168, THEA 169, THEA 198-I

### Track 3: Film Making

Upper-division requirements (71 units)

- THEA 101, THEA 102, THEA 109, THEA 170 (16 units)
- Literature, History, Criticism (16) units from CPLT 146, CPLT 149, ENGL 117A, ENGL 117B, ENGL 117C, ENGL 117T, ENGL 129A, ENGL 129B, ENGL 129C, THEA 120A, THEA 120B, THEA 120C, THEA 121
- Film Making (19) units from THEA 155, THEA 156A, THEA 156B, THEA 157
- Screenwriting (12) units from THEA 166A, THEA 166B, THEA 166C
- Eight (8) additional units from CRWT 172, THEA 110A, THEA 110B, THEA 150A, THEA 150B, THEA 163, THEA 165A/CRWT 167A, THEA 165B/CRWT 167B, THEA 167, THEA 168, THEA 169, THEA 198-I

## Minor

The minor in Theatre follows the structure of the major requirements by exposing students to each of the areas that are essential to the creation of theatre, with the opportunity to take an additional course for depth or more exposure. The inclusion of THEA 170 (Advanced Dramatic Production) gives the students the opportunity to put course work into the proper context and provides them with a practical understanding of the workings and problems of production. The minor in Theatre provides students with a basic understanding in major areas of study including theatre literature, performance, and design. It also introduces the nonmajor to the discipline of Theatre, providing breadth for those students majoring in unrelated disciplines.

Requirements for the minor (20 units)

- THEA 100, THEA 101, THEA 109
- Four (4) units of THEA 170 (This 2-unit course must be taken twice, in two different areas, 2 units of which must be in residence.)
- One 4-unit upper-division course selected from the department's Literature, History, Criticism area or the Performance, Direction, Playwriting, Screenwriting, Design, and Theatre Technology area.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Education Abroad Program

The Theatre Department encourages students to participate in the Education Abroad Program (EAP). Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Graduate Program

The Department of Theatre in conjunction with the Department of Creative Writing offers the M.F.A. degree in Creative Writing and Writing for the Performing Arts. See Creative Writing and Writing for the Performing Arts in this catalog for more information and program requirements.

## Lower-Division Courses

**THEA 010. Introduction to Acting (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to acting in theatre, film, television, and performance art. Through exercises, lectures, videos, and on-site visits, explores the work of actors and their collaborations with other artists in historical and contemporary settings. Recommended for nonmajors. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination.

**THEA 021. Culture Clash: Studies in Latino Theatre and Film (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to Latino theatre and film from 1965 to the present. Examines the major works of playwrights and important films and videos. Cross-listed with ENGL 021.

**THEA 022. Shakespeare in Performance (4)** Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): none. A study of contemporary Shakespearean production on stage and on film. Considers the problems of adapting the text, creating visual elements, speaking the language, and performing the characters. Numerous videos depict a wide range of performance styles. Credit is awarded for only one of ENGL 018 or THEA 022.

**THEA 038. From Hamlet to Babylon 5: Introduction to Design in Film, Television, and Theatre (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the design process for film, television, and theatre. Addresses the influence design has on the viewer, as well as how looks are achieved in different media. Cross-listed with ART 028.

**THEA 050. Public Speaking (4)** Lecture, 3 hours; studio, 3 hours. Covers the principles and practice of effective speech composition and delivery. Provides the communicative skills essential in professional careers and community life.

**THEA 066. Screenwriting: How Movies Work (4)** Lecture, 3 hours; discussion, 1 hour; screening, 8 hours per quarter. Prerequisite(s): none. An introduction to writing for stage and screen. Addresses structure, character, dialogue, theme, and story. Cross-listed with CRWT 066 and MCS 066.

**THEA 067. Introduction to Playwriting and Screenwriting (4)** Workshop, 3 hours; written work, 3 hours; screening, group activity, 3 hours/quarter; screening, individual activity, 3 hours/quarter. Prerequisite(s): CRWT 066/MCS 066/THEA 066 or consent of instructor. An introduction to writing for stage and screen. Addresses structure, character, dia-

logue, theme, and story. (Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination.)

**THEA 070. Living Theatre (4)** Lecture, 3 hours; discussion, 1 hour. The art of theatre through an introductory study of its component arts: dramatic literature, acting, directing, and mise en scene and their historical development. Lectures, demonstrations, special projects.

**THEA 099. Introduction to the Theatre Department (1)** Lecture, 1 hour. Prerequisite(s): none. An introduction to the faculty and the areas of study offered by the Department of Theatre. Promotes a better understanding of undergraduate opportunities, graduate training, and careers in the entertainment industry. Graded Satisfactory (S) or No Credit (NC).

## Upper-Division Courses

**THEA 100. Play Analysis (4)** Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Close analysis of selected plays: structure, character, imagery.

**THEA 101. Introduction to Design (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A comprehensive introduction to design for theatre, film, and television. Topics include design principles and practice of set, costume, and lighting; the history of design; and conceptual approaches and research.

**THEA 102. Production Techniques for Theatre, Film, and Television (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of technical production practices, equipment, and architecture for theatre, film, and television design. Explores the application of production practices and principles of stagecraft in relation to scenic, costume, lighting, sound, and projection design.

**THEA 109. Acting: The Process (4)** Lecture, 3 hours; studio, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. A comprehensive introduction to the process of acting. Topics include theories, history, and expressive skills related to theatrical performance.

**THEA 110A. Acting: Fundamentals (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): THEA 109 or consent of instructor. A study of the acting fundamentals. Topics include concentration, motivation, and the psychophysical development of the actor's instrument. Explores basic approaches to characterization through monologues and introductory scene study.

**THEA 110B. Acting: Techniques (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): THEA 110A or consent of instructor. An examination of acting techniques with an emphasis on the American Method. Topics include actions, objectives, and characterization. Includes analysis and performance of scenes from modern and contemporary drama.

**THEA 111A. Acting: Styles (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): THEA 110A, THEA 110B, consent of instructor. Advanced scene study in classic theatre to develop the actor's skills with heightened language. Emphasis is on works by Shakespeare. Topics include performance styles and working with text to emphasize environment, actions, and intentions.

**THEA 111B. Acting: Styles (4)** Lecture, 2 hours; studio, 4 hours. Prerequisite(s): THEA 111A, consent of

instructor. Advanced scene study in English and European theatre to expand the actor's emotional range and character range. Emphasis is on works by Chekhov. Topics include performance styles and working with the text to emphasize environment, actions, and intentions.

**THEA 112 (E-Z). Voice for Actors (4)** Lecture, 2 hours; assignment of the remaining hours varies from segment to segment. Prerequisite(s): upper-division standing or consent of instructor. Study in voice, vocal performance techniques, and theories for actors.

**THEA 113 (E-Z). Movement for Actors and Performers (4)** Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of movement techniques and theories for actors and performers. F. Stage Combat; M. Mime; N. Nonverbal Theatre.

**THEA 114. Acting for Writers (4)** Lecture, 2 hours; discussion, 2 hours; outside research, 2 hours. Prerequisite(s): CRWT 164C/THEA 164C or THEA 166C. Examines the theory and practice of acting to enable writers to better understand how language reflects character, as well as how actors turn the written word into spoken language. Includes text work and improvisation. Credit is awarded for only one of CWPA 214 or THEA 114. **Barr**

**THEA 115. Hip Hop Theatre (4)** Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides students with tools to create new work by using elements of hip hop culture such as Graffiti Art, Emceeing (rappin'), DeeJayin' and Breakdancin' as primary means of storytelling on stage. Exposes students to theoretical aspects of hip hop culture and a working knowledge of playwriting, acting, directing, and design.

**THEA 120A. Literature and History of the Theatre: The Classical Period through the Italian Renaissance (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the literature and history of the theatre from the classical period through the Italian Renaissance. Focuses on analysis of representative plays, theatrical architecture, and production modes.

**THEA 120B. Literature and History of the Theatre: The Elizabethan Period through the Nineteenth Century (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the literature and history of the theatre from the Elizabethan period through the nineteenth century. Focuses on analysis of representative plays, theatrical architecture, and production modes.

**THEA 120C. Literature and History of the Modern and Contemporary Theatre (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the literature and history of the modern and contemporary theatre. Focuses on analysis of representative plays, theatrical architecture, and production modes.

**THEA 121. World of the Play (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of a significant play in the context of the social, intellectual, and artistic movements of its time. Offered simultaneously with the Theatre Department's production of the play. May also consider related works and writings. Course is repeatable.

**THEA 122. Theatre for Social Change (4)** Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines theatre for social change, as created by grassroots theatrical organizations. Focus is on how community-based theatre groups

develop works and how theatre in public or private spaces redefines traditional theatre practices.

**THEA 124A. American Theatre, 1900-1945 (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examination of the major American playwrights, theatrical figures, and movements from 1900 through World War II.

**THEA 124B. American Theatre, 1945-Present (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examination of the major American playwrights, theatrical figures, and movements from World War II to the present.

**THEA 125 (E-Z). History of the Theatre (4)** Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the plays, playhouses, and players of the following theatrical eras: E. Classical Theatre; F. Medieval Theatre; G. Renaissance Theatre; I. Romantic Theatre; J. Realistic Theatre; K. Contemporary Theatre; M. American Theatre; N. Neo-Classical Theatre; S. American Musical Theatre; T. Asian Theatre; W. American Theatre and Drama of the Great Depression; X. Experimental Theatre in America. Segments are repeatable.

**THEA 126A. History of Dress (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the psychological, sociological, and economic history of fashion and dress from 4000 B.C. to A.D. 1700.

**THEA 126B. History of Dress (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the psychological, sociological, and economic history of fashion and dress from A.D. 1700 to the present.

**THEA 127. Theories of the Modern Theatre (4)** Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the major theories underlying twentieth-century theatre practice. Special attention is paid to the ideas of important theatre artists such as Konstantin Stanislavsky, E. Gordon Craig, Antonin Artaud, and Bertolt Brecht.

**THEA 131. Sound Design for the Theatre (4)** Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces sound design for theatre productions. Covers topics such as critical listening, psycho acoustics, computer editing, sound recording and processing, and copyright laws pertaining to sampling.

**THEA 132. Lighting Design for Theatre, Film, and Television (4)** Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): THEA 102 or consent of instructor. A survey of lighting design for theatre, film, and television. Students view and discuss examples of lighting design and participate in class projects. Develops skills associated with the creation and execution of a lighting design.

**THEA 133. Design for Theatre, Film, and Television (4)** Lecture, 4 hours. Prerequisite(s): THEA 101. An introduction to basic skills and techniques for theatre design and to issues of contemporary design for theatre, film, and television. Topics include sketching, rendering, drafting, and model making.

**THEA 135. Costume Design for Theatre (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): THEA 101. A study of theory, principles, and practice of costume design for theatre.

**THEA 138. Art Direction for Film and Television (4)** Lecture, 3 hours; individual study, 1.5 hours; screening, 1.5 hours. Prerequisite(s): THEA 101 or consent

of instructor. An introduction to the design principles and methods professional art directors use in the entertainment industry. Projects related to feature film and television design explore current methods of presentation and composition for the film and television camera.

**THEA 141. Drafting and Rendering for Theatre, Film, and Television (4)** Lecture, 3 hours; studio, 3 hours. Prerequisite(s): THEA 102 or consent of instructor. A study of basic drafting and drawing skills. Topics include drafting conventions, graphic skills, black and white drawing, color rendering, and story boarding.

**THEA 142. Costume Construction (4)** Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. A theoretical and practical study of theatrical costume production. Topics include draping and flat pattern development, fabric, fitting, and sewing techniques. Costume projects are required. Sewing skills are helpful but not essential.

**THEA 143. Scene Painting (4)** Discussion, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the skills needed to translate scaled painter's elevations to full-size, two-dimensional and three-dimensional scene elements. Covers fundamental paint application techniques such as wet blending, glazing, dry brushing, lining, and spattering. Includes a review of paints and materials commonly used in theatre, film, and television.

**THEA 144. Makeup for Theatre, Film, and Television (4)** Discussion, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the theory and practice of makeup for theatre, film, and television. Students complete advanced projects and a makeup research notebook. Includes demonstrations by industry professionals.

**THEA 145. Computer-Aided Design (CAD) for Theatre, Film, and Television (4)** Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): THEA 102 or consent of instructor. Explores the established computer-aided design (CAD) applications in the design industry: 3RD Studio Max, Adobe Photoshop, and Vectorworks.

**THEA 150A. Directing (4)** Lecture, 4 hours. Prerequisite(s): THEA 110A, THEA 110B; or consent of instructor. A comprehensive introduction to directing for the stage. Topics include working with actors, articulation of stage space, and theories of directing.

**THEA 150B. Directing (4)** Lecture, 4 hours. Prerequisite(s): THEA 150A or consent of instructor. An examination of the rehearsal process with a focus on combining the elements of text, acting, and design.

**THEA 155. Introduction to Digital Film Production (5)** Lecture, 4 hours; laboratory, 3 hours. Prerequisite(s): CRWT 066/MCS 066/THEA 066 or upper-division standing or consent of instructor. Introduces the skills needed for making a narrative film. Also includes examining and utilizing scripts, cameras, lighting, sound, and editing. Includes filmmaking projects.

**THEA 156A. Digital Film Production (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): THEA 155 with a grade of "C" or better or consent of instructor. Examines the techniques of narrative filmmaking and directing for the camera. Emphasizes the working relationship with actors.

**THEA 156B. Digital Film Production (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): THEA 156A or consent of instructor. Examines the techniques of postproduction for narrative filmmaking. Emphasizes sound and editing processes.

**THEA 157. Introduction to Film Editing (5)** Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): THEA 155. Examines the art and craft of editing the narrative film. Includes hands-on work in editing a montage, a short documentary, and a narrative fiction scene.

**THEA 160. The Filmmaker's Life (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An overview of the various jobs (and their requirements) connected to the process of creating products for film and television entities.

**THEA 161. African American Drama (4)** Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the major African American plays and playwrights from the 1800s to the present.

**THEA 163. Writing the Short Film (4)** Workshop, 3 hours; written work, 3 hours. Prerequisite(s): THEA 166C or consent of instructor. Addresses the mechanical and creative components of crafting a screenplay for a short film.

**THEA 164A. Beginning Playwriting (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): THEA 100 or CRWT 056 or consent of instructor. Seminar in the practice of playwriting centering on the construction of a plot. Cross-listed with CRWT 164A.

**THEA 164B. Intermediate Playwriting (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 164A/THEA 164A. Seminar in the practice of playwriting. Revisions of works in progress with emphasis on character development and techniques for writing dialogue. Cross-listed with CRWT 164B.

**THEA 164C. Advanced Playwriting (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 164B/THEA 164B. Seminar in the practice of playwriting. Playwrights' participation in staged readings of their work. With consent of instructor, course is repeatable to a maximum of 8 units. Cross-listed with CRWT 164C.

**THEA 165A. Plays in Production (4)** Workshop, 8 hours. Prerequisite(s): CRWT 164A/THEA 164A or THEA 166A or consent of instructor. Examines the development and preproduction of half-hour or one-hour plays written specifically for stage, soundstage, radio, television, or Web-based broadcasting. Explores the basics of sound and video production to enhance the writing and rewriting process. Course is repeatable to a maximum of 8 units. Cross-listed with CRWT 167A.

**THEA 165B. Plays in Production (4)** Workshop, 8 hours. Prerequisite(s): CRWT 167A/THEA 165A or consent of instructor. Advanced production and postproduction of half-hour and one-hour drama (including comedy) for radio, video, or webcasting. Postproduction of previously taped shows. Course is repeatable to a maximum of 8 units. Cross-listed with CRWT 167B.

**THEA 166A. Screenwriting: Introduction (4)** Lecture, 3 hours; extra reading, 3 hours; extra reading activity: outside reading consists of textbook assignments, film viewing and reading each other's work for comment and discussion. Prerequisite(s): CRWT 066/MCS 066/THEA 066 or consent of instructor. Explores the fundamentals of screenwriting. Includes story development, plotting, and characterization as they are used in creating a complete script for television or feature film.

**THEA 166B. Screenwriting: Outline to First Draft (4)** Lecture, 3 hours; extra reading, 3 hours; extra reading activity: outside reading consists of screenplay texts, film viewing and reading each other's work for com-

ment and discussion. Prerequisite(s): THEA 166A or consent of instructor. Explores the fundamentals of screenwriting. Includes story development, plotting, and characterization as they are used in creating a complete script for television or feature film.

**THEA 166C. Screenwriting: Rewrites and Writing for Television (4)** Lecture, 3 hours; extra reading, 3 hours; extra reading activity: outside reading consists of screenplay texts, film viewing and reading each other's work for comment and discussion. Prerequisite(s): THEA 166B or consent of instructor. Explores the fundamentals of screenwriting. Includes story development, plotting, and characterization as they are used in creating a complete script for television or feature film. Course is repeatable to a maximum of 8 units.

**THEA 167. Writing for Television: Creating the One-Hour Series Drama (4)** Seminar, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the craft of writing for television with the primary focus on production of original work. Students write a one-hour pilot, create series guidelines, and formulate work leading to a 13-episode series. Course is repeatable to a maximum of 12 units.

**THEA 168. Writing for the Family Audience (4)** Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): THEA 166C. An introduction to the demands and challenges of writing film and television projects designed for the family audience.

**THEA 169. Rewriting the Script (4)** Workshop, 4 hours. Prerequisite(s): CRWT 164C/THEA 164C or THEA 166C; consent of instructor is required for students repeating the course. Covers rewriting a full-length script (screenplay or play). Course is repeatable to a maximum of 8 units. Credit is awarded for only one of CWPA 269 or THEA 169.

**THEA 170. Advanced Dramatic Production (1-4)** Studio, 5-20 hours. Prerequisite(s): consent of instructor; demonstrated ability in dramatic production. Advanced assignments in dramatic production, performance, and stage management. Course is repeatable.

**THEA 176. Performing Arts of Asia (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theater, and ritual in four major geocultural regions of Asia: Central, East, South, and Southeast. No Western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with ANTH 128, AST 128, DNCE 128, and MUS 128.

**THEA 180 (E-Z). Theatre Practicum (4)** Discussion, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. An investigation of theatrical production theories and practices. E. Contemporary Mexican Theatre; L. Musical Comedy; M. Arts Management; Q. Plays in Progress; R. New Plays; S. Improvisation.

**THEA 190. Special Studies (1-5)** Prerequisite(s): consent of the chair of the department. Course is repeatable to a maximum of 20 units.

**THEA 191 (E-Z). Seminar in Theatre (4)** Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): consent of instructor. Covers various topics on a rotating basis. Includes playwriting, acting, directing, scenic design, theatre history, and dramatic literature. J. Staging the Middle East; M. American Frontier in American Drama; N. Theatre of Eugene O'Neill; S. Script to Production; W. Women in Theatre: Theory and Performance.

**THEA 195. Senior Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): senior standing; consent of Department Chair. Open by invitation only. Presentation of a significant piece of creative work with faculty supervision. Course is repeatable to a maximum of 8 units.

**THEA 198-I. Individual Internship in Theatre (1-12)** Internship, 2-24 hours; reading and written work, 1-12 hours. Prerequisite(s): upper-division standing; consent of instructor. An internship in a theatre, television, or film production company. The student works with directors or designers in one or more areas of professional production, such as acting, design, costumes, lighting, and sound. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

**THEA 199. Senior Research (1-4)** Prerequisite(s): consent of chair of the department. Open to seniors by invitation only. Research in the practice and/or theory of the theatre.

## Graduate Courses

**THEA 283. Shakespeare and Film (4)** Seminar, 3 hours; screening, 2 hours; outside research, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the influence Shakespeare exerted on film, from faithful adaptations to broad reinventions. Compares Shakespeare in his period and ours, the wide range of movies that have taken from Shakespeare for inspiration, and how modern filmmakers deal with issues of language and structure.

## UC Riverside Washington Academic Internship Program (UCDC)

Undergraduate Education  
2319 Olmsted Hall; [www.ucdc.ucr.edu](http://www.ucdc.ucr.edu)

The UCR Washington Academic Internship Program provides undergraduate students with a multi-dimensional educational experience in Washington, D.C. Students undertake academic pursuits as well as cultural and social activities. The program combines course work with field research and internship experience. Students also have the opportunity to tour local sites and dialogue with distinguished professionals in the Speaker Series. For more information see UCR Washington Academic Internship Program in the front of this catalog.

## Upper-Division Courses

**ENGR 191W. Seminar in Washington, D.C. (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Washington Center Program. Examines aspects of the Washington, D.C., area, including cultural, political, and governmental institutions as well as the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the

unique aspects of Washington, D.C. Required of participants in the UCR Washington, D.C., Center Program. Cross-listed with HASS 191W and NASC 191W.

**HASS 191W. Seminar in Washington, D.C. (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Washington Center Program. Examines aspects of the Washington, D.C., area, including cultural, political, and governmental institutions as well as the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Washington, D.C. Required of participants in the UCR Washington, D.C., Center Program. Cross-listed with ENGR 191W and NASC 191W. See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.

**NASC 191W. Seminar in Washington, D.C. (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Washington Center Program. Examines aspects of the Washington, D.C., area, including cultural, political, and governmental institutions as well as the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Washington, D.C. Required of participants in the UCR Washington, D.C., Center Program. Cross-listed with ENGR 191W and HASS 191W.

## University Honors Program

**Subject abbreviation: HNPG**  
**College of Humanities, Arts, and Social Sciences**  
Thomas M. Perring, Ph.D., Director  
2316 Olmsted Hall  
(951) 827-5323; [honors@ucr.edu](mailto:honors@ucr.edu)  
[honors.ucr.edu](http://honors.ucr.edu)

### Committee in Charge

Christine Ward Gailey, Ph.D. (Anthropology, Women's Studies)  
Nigel C. Hughes, Ph.D. (Earth Sciences)  
Eugene Perry Link, Ph.D. (Comparative Literature and Foreign Languages)  
Robert Nash Parker, Ph.D. (Sociology)  
Thomas M. Perring, Ph.D. (Entomology)  
Sharon Walker, Ph.D. (Chemical and Environmental Engineering)  
Vorris Nunley, Ph.D. (English)

Outstanding students from all disciplines and majors can participate in the University Honors Program (UHP). The UHP challenges honors students to take an active role in shaping their education. The UHP offers a variety of extracurricular and service learning opportunities. Students benefit from Honors staff support in the areas of fellowship applications, internships, application to graduate schools, and summer enrichment programs. A reading room, seminar room, lounge, and work space with computer facilities are available to honors students.

## Lower-Division Honors

This component is divided into two opportunities. Admission to the First Year component of lower-division honors is based on an application, essay, high school grades, aptitude scores and achievement test scores. Students take honors courses and participate in workshops, personal growth, and community service activities. The UHP lower-division curriculum provides special seminars, projects, and other courses designed to introduce honors students to the rewards of scholarship and research. First-year courses encourage innovative approaches to introductory courses and provide an avenue for faculty to present courses that concentrate on their research interests. UHP seminars expose students to methods of conceptualizing issues and framing questions that characterize disciplines.

## Sophomore Applied Learning

The sophomore component of Lower Division is designed for continuing Honors students as well as provide an opportunity for gifted students who did not have the opportunity to participate in the first year component. This component offers students an introduction to the Honors experience and the wealth of opportunities available to undergraduates at UC Riverside. Our hope is that participants will go on to engage in an array of meaningful scholarly endeavors throughout their years of undergraduate study. Interested students must apply to the program and meet the minimum GPA and units earned by spring quarter of their freshman year at UCR. For details, visit [honors.ucr.edu](http://honors.ucr.edu).

## Upper-Division Honors

The upper-division curriculum provides students with the framework to produce a thesis or project, a substantial, independent product of scholarship, research, or creative activity. This structure is adaptable to almost any major and allows each student the flexibility to work with a faculty advisor to shape a research program to meet the ambitions of the project. We have excellent student-faculty research and leadership opportunities for juniors and seniors participating in Upper-Division Honors. Continuing UCR students with an excellent academic record may apply or be nominated to participate in upper-division honors whether or not they completed lower-division honors. Students who transfer to UCR as juniors with excellent academic records may also apply or be nominated to the upper-division UHP. During the junior year, students narrow their research or leadership focus, select a faculty supervisor, and prepare to undertake the honors project. The program provides support in all phases of this planning. The honors project is usually undertaken in the first two quarters of the senior year and is completed well before graduation. The completed thesis or project is submitted to the faculty advisor for approval.

The approved thesis or project, a cumulative GPA of 3.4 in the major, and an upper-division GPA of at least 3.50 qualify the student for graduation with upper-division honors. The honors designation appears on the official transcript.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Lower-Division Courses

**ANTH 001H. Honors Cultural Anthropology (4)**  
Description under Anthropology.

**CHEM 01HA, CHEM 01HB, CHEM 01HC. Honors General Chemistry (4, 4, 5)**  
Description under Chemistry.

**CHEM 097H. Freshman Honors Project: Introduction to Research (1-4)**  
Description under Chemistry.

**CHEM 122H. Honors Discussion for Organic Chemistry (4)**  
Description under Chemistry.

**CHEM 123H. Honors Discussion for Organic Chemistry (4)**  
Description under Chemistry.

**CHEM 124H. Honors Discussion for Organic Chemistry (4)**  
Description under Chemistry.

**CRWT 097H. Freshman Honors Project: Poetry (4)**  
Description under Creative Writing.

**ECON 002H. Honors Introduction to Macroeconomics (4)**  
Description under Economics.

**ENSC 001H. Honors Natural Resources and the Environment (4)**  
Description under Environmental Sciences.

**ENSC 002H. Honors Environmental Quality (4)**  
Description under Environmental Sciences.

**ENSC 003H. Honors Contemporary Issues in the Environmental Sciences (4)**  
Description under Environmental Sciences.

**ETST 001H. Honors Introduction to the Study of Race and Ethnicity (4)**  
Description under Ethnic Studies.

**ETST 007H. Honors Introduction to Native American Studies in Comparative Perspective (4)**  
Description under Ethnic Studies.

**ETST 012H/RLST 012H. Honors Religious Myth and Rituals (4)**  
Description under Ethnic Studies and Religious Studies.

**HIST 010H. Honors World History: Prehistory to 1500 (4)**  
Description under History.

**HIST 015H. Honors World History: 1500 to 1900 (4)**  
Description under History.

**HIST 020H. Honors World History: Twentieth Century (4)**  
Description under History.

**MATH 09HA, MATH 09HB, MATH 09HC.**

**First Year Honors Calculus (4, 4, 4)**  
Description under Mathematics.

**PHIL 001H. Honors Introduction to Philosophy (4)**  
Description under Philosophy.

**PHIL 007H. Honors Introduction to Critical Thinking (4)**  
Description under Philosophy.

**PHIL 008H. Honors Introduction to Logic (4)**  
Description under Philosophy.

**RLST 005H. Honors Introduction to Asian Religions (4)**  
Description under Religious Studies.

**RLST 015H. Honors Death (4)**  
Description under Religious Studies.

**WMST 030H. Violence Against Women (4)**  
Description under Women's Studies.

## Upper-Division Courses

**AHS 195H. Senior Honors Thesis. (1-4)**  
Description under Art History.

**BUS 199H. Senior Honors Research. (4)**  
Description under Business Administration.

**HIST 199H. Senior Honors Research. (1-5)**  
Description under History.

## Lower-Division Courses

**HNP 009. Honors First-Year Workshop (2)**  
Workshop, 1 hour; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Faculty presentations explore civic engagement and its role in liberal arts education. Includes opportunity for dialogue, clarification of values and beliefs, and deeper exploration of topics that develop critical thinking and communication. Satisfactory (S) or No Credit (NC) grading is not available.

**HNP 010. First-Year Colloquium (1)**  
Colloquium, 1 hour. Prerequisite(s): open only to students in the University Honors Program who are freshmen or first-year transfer students. Introduces students to academic research conducted by UCR faculty. Presentations are multidisciplinary and cover the sciences, humanities, and social sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

**HNP 012. Global Health, Agriculture, and Economic Development (4)**  
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Focuses on human health and agriculture in developing countries and their relationship to global poverty, economic development, and technology. Emphasizes developing solutions using an interdisciplinary focus. Provides potential leadership skills in addressing worldwide poverty. Satisfactory (S) or No Credit (NC) grading is not available.

**HNP 015. Ignition Seminar in Honors (4)**  
Seminar, 3 hours; screening, 1 hour per quarter; term paper, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Additional prerequisites may be required for segments of this course. Addresses interdisciplinary topics drawn from the arts, business, engineering, humanities, natural sciences, or social sciences. Provides opportunities to explore what the university has to offer. Topics vary from quarter to quarter. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable as topics change up to a maximum of 12 units.

**HNPG 020. The Nature of Academic Research (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): sophomore standing in the University Honors Program or consent of instructor. Presentations by faculty from a cross section of campus disciplines on the nature of research in their disciplines and their own current projects. Presentations are followed by discussions with students. Students work on group projects comparing how research on a selected issue is approached by two related disciplines. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 023 (E-Z). Honors Seminar in Mathematics, Statistics, and Computer Science (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of one or more of the following areas: Mathematics, Statistics, and Computer Science. Topics and instructors vary from year to year and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 024 (E-Z). Honors Seminar in Biological Sciences (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of one or more of the Biological Sciences. Topics and instructors vary from year to year and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 025 (E-Z). Honors Seminar in Physical Sciences (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of one or more of the Physical Sciences. Topics and instructors vary from year to year and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 031 (E-Z). Honors Seminar in the Fine Arts (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of one or more of the Fine Arts. Topics and instructors vary from year to year and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 033 (E-Z). Honors Seminar in Humanities (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of one or more of the

Humanities. Topics and instructors vary from year to year and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 034 (E-Z). Honors Seminar in Religious Studies (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of religious studies. Topics and instructors vary and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 036 (E-Z). Honors Seminar in History (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of history. Topics and instructors vary and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 037 (E-Z). Honors Seminar in Literature (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of literature. Topics and instructors vary and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 038 (E-Z). Honors Seminar in Philosophy (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of philosophy. Topics and instructors vary and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 041 (E-Z). Honors Seminar in Economics and Political Science (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of one or more of the following areas: Economics and Political Science. Topics and instructors vary from year to year and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 042 (E-Z). Honors Seminar in Anthropology, Psychology, and Sociology (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this

course; see the University Honors Program. Introduces research and methods at the frontiers of one or more of the following areas: Anthropology, Psychology, and Sociology. Topics and instructors vary from year to year and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 043 (E-Z). Honors Seminar in Social Sciences (4)** Seminar, 3 hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): admission to the University Honors Program or consent of instructor. Additional prerequisites may be required for segments of this course; see the University Honors Program. Introduces research and methods at the frontiers of one or more of the Social Sciences. Topics and instructors vary from year to year and are chosen by the Honors Program Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 090. Special Studies (2-4)** Consultation, 1 hour; outside research, 6-12 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor; a written proposal approved by the program chair. Structured to meet specific educational needs. Addresses course content, style, and requirements determined in collaboration with the instructor. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 4 units.

**HNPG 096A. Foundations of Leadership: Leadership Success Strategies (4)** Seminar, 3 hours; term paper, 2 hours; written work, 2 hours. Prerequisite(s): admission to the University Honors Program (UHP) or consent of instructor; consent of the Director of the UHP. An introduction to leadership theory, ideology, language, and skills development. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 096B. Ethical Leadership in Practice: Philosophy of Leadership (4)** Seminar, 3 hours; term paper, 2 hours; extra reading, 2 hours. Prerequisite(s): admission to the University Honors Program (UHP) or consent of instructor; consent of the Director of the UHP; HNPG 096A. An introduction to the nature, styles, skills, and concepts of ethical leadership that utilizes historic and contemporary models and emphasizes moral roots of responsible leadership. Examines an array of leadership styles and ethical considerations for leaders. Students apply what they are learning through campus and community involvement. Satisfactory (S) or No Credit (NC) grading is not available.

**HNPG 096C. Mentors in Action: Student Leadership and Communities (4)** Seminar, 3 hours; extra reading, 2 hours; practicum, 6 hours. Prerequisite(s): admission to the University Honors Program (UHP) or consent of instructor; consent of the Director of the UHP; HNPG 096A. Provides leadership experiences and the opportunity to develop leadership skills through the planning and implementing of student activities and services. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 8 units.

**HNPG 097. Honors Lower-Division Research (2-4)** Consultation, 1-4 hours; outside research, 2-4 hours; term paper, 2-4 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor; consent of the University Honors Program. Independent research or projects completed in consultation with a faculty member. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 4 units.

**HNPG 098-I. Honors Individual Internship (2-4)**

Consultation, 1-2 hours; internship, 4-8 hours; written work, 1-2 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Internship placement on or off campus that provides opportunities to acquire skills and experience for future endeavors. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 4 units.

## Upper-Division Courses

**HNPG 150. Research and Creative Activity Across the Disciplines (2)**

Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): admission to the university honors program or consent of instructor; upper-division standing. Addresses the questions "What is knowledge?" and "What is research?". Illustrates how researchers select a significant issue, review what is already known about it, and pose a research question whose answer promises to advance knowledge. Explores ways in which these processes differ across the humanities, social sciences, and natural sciences. Graded Satisfactory (S) or No Credit (NC).

**HNPG 151. Individual Projects in Research or Creative Activity (2)**

Lecture, 3 hours per quarter; workshop, 3 hours per quarter; outside research, 4 hours; written work, 1 hour. Prerequisite(s): admission to the university honors program or consent of instructor; upper-division standing; HNPG150 completed with a B or better, an approved discipline specific research methodology course or co-curricular creative experience, approval of course credit is determined by Honors Faculty Director. Under the direction of faculty advisors, facilitates the discovery, design, and development of a capstone project to be pursued during the senior year. Graded Satisfactory (S) or No Credit (NC).

**HNPG 190. Special Studies (1-4)** Consultation, 1 hour; outside research, 3-12 hours. Prerequisite(s): good standing; admission to the upper-division University Honors Program or consent of instructor; a written proposal approved by the program chair. Structured to meet specific educational needs. Addresses course content, style, and requirements determined in collaboration with the instructor. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

**HNPG 195H. Senior Honors Thesis (1-4)** Thesis, 3-12 hours. Prerequisite(s): admission to the University Honors Program; senior standing. Students complete research and write and present a senior honors thesis under the guidance of a faculty member of the University Honors Program. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

**HNPG 197H. Honors Research for Undergraduates (1-4)** Outside research, 3-6 hours; individual study, 3-6 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor; upper-division standing. An introduction to research under the supervision of University Honors Program faculty. Requires a research project. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

**HNPG 198-I. Honors Individual Internship (1-4)**

Consultation, 1 hour; internship, 3-12 hours; written work, 1-4 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor; upper-division standing. Internship placement on or off campus that provides opportunities to acquire skills and experience for future endeavors. Students

who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 12 units.

## Urban Studies Minor

**Subject abbreviation: URST**

**College of Humanities, Arts, and Social Sciences**

Mason Gaffney, Ph.D., Chair  
Office, 4128 Sprout  
(951) 827-3266; [urbanstudies.ucr.edu](http://urbanstudies.ucr.edu)

**Committee in Charge**

Richard Arnott, Ph.D. (Economics)  
Gary Dymski, Ph.D. (Economics)  
John Ganim, Ph.D. (English)  
Patricia Morton, Ph.D. (Art History)  
Stephen E. Cullenberg, Ph.D.

*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

The Urban Studies minor is an adaptation of a well-developed interdisciplinary focus on urban concepts, issues, and problems in order to offer the chance for increased understanding of urban processes. The minor also provides preparation leading to increased employment opportunities at the municipal, state, or federal level, or to graduate work in one of several areas related to urban studies.

Requirements for the minor (24 units)

1. URST 010/SOC 010
2. URST 143/SOC 143
3. URST 146/ECON 146
4. URST 172/POSC 172
5. URST 182/SOC 182
6. URST 184/AHS 184

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Lower-Division Courses

**URST 010. The City: An Introduction (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introductory exploration of urban processes. Subjects examined include definition, form, structure and growth of urban regions as seen from the viewpoints of various disciplines. Cross-listed with SOC 010.

**URST 014. Popular Musics of the World (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to issues surrounding popular and urban musics of the world, focusing on three major geocultural areas: Africa, Asia, and the Americas. Emphasizes the relationship between mass-mediated music and issues of cultural hegemony, resistance, and subversion. Analyzes the cultural impact of media technology on music performance and reception. Cross-listed with ETST 014 and MUS 014.

**URST 021. Introduction to Architecture and Urbanism (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the built environment including buildings, gardens, and cities, examined in terms of historical, cultural, social,

technological, and political factors. Emphasis is on examples from Southern California. Cross-listed with AHS 021.

## Upper-Division Courses

**URST 143. Urban Sociology (5)** Lecture, 3 hours; extra reading, 3 hours; field, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. A comparative examination of metropolitan and other urban communities, with emphasis on processes of urbanization. Cross-listed with SOC 143.

**URST 146. Urban Economic Problems (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Applies economic principles to the major problems of the modern urban community, such as poverty, discrimination, deterioration of the environment, and housing problems. Explores programs for alleviation of or solution to these issues. Cross-listed with ECON 146.

**URST 172. Urban Politics and Policies (4)** Lecture, 3 hours; term paper and extra reading, 3 hours. Prerequisite(s): upper-division standing; POSC 010 or POSC 010H. A general analysis of urban politics in the United States. Topics include theories of urban politics, structure of political competition, leading political roles, and major policy problems. Cross-listed with POSC 172.

**URST 178. The Modern City (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the modern metropolis from the Industrial Revolution to the present. Explores the history and theory of modern urbanism through case studies of metropolitan areas with a rich urban culture, architecture, and morphologic features. Investigates approaches to the problems of the large urban agglomeration in the context of social, political, and cultural conditions. Cross-listed with AHS 178.

**URST 182. Urban Problems (4)** Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An interdisciplinary examination of selected urban problems such as civil disorders, transportation, housing, welfare, and planning. Cross-listed with SOC 182.

**URST 184. Modern Architecture (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017C or AHS 021/URST 021 or upper-division standing or consent of instructor. Modern architecture and its sources from 1800. Cross-listed with AHS 184.

**URST 185. Architectural Theory from Vitruvius to Venturi (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017A or AHS 017B or AHS 017C or AHS 021/URST 021 or consent of instructor. History of architectural thought from Vitruvius to the present, with emphasis on the modern period. Surveys the major themes of architectural theory and investigates the relationship between ideas about architecture and architectural production. Cross-listed with AHS 185. **Morton**

## Visual Arts

**See Art (Graduate Program)**

# Western American Studies Minor

## College of Humanities, Arts, and Social Sciences

Clifford E. Trafzer, Ph.D., Chair  
Office, 1303A Watkins Hall  
(951) 827-5524  
[westernamericanstudies.ucr.edu](http://westernamericanstudies.ucr.edu)

### Committee in Charge

Rebecca Kugel (History)  
Michelle Raheja (English)  
Stella Nair (Art History)  
Stephen E. Cullenberg, Ph.D.  
*Dean, College of Humanities, Arts, and Social Sciences, ex officio*

The Western American Studies minor is intended to provide the student with a basic understanding of the history and institutional development of the Western United States — the Great Plains, the Southwest, and California — including the geographical and cultural factors that have shaped their history.

Requirements for the Western American Studies minor are 20 units distributed as follows:

- HISA 137, HISA 138
- One course from each of the following groups:
  - ETST 004/HIST 004, ETST 180/HISA 140, ETST 181/HISA 141, ETST 182/HISA 142, ETST 183/HISA 143
  - ANTH 115E, ANTH 140F, ETST 110M
  - ETST 108-I, ETST 108L, ETST 110K

History majors are not allowed to count HISA 137 or HISA 138 toward both their major and a minor in Western American Studies. If HISA 137 or HISA 138 is counted toward the major, then for the minor and additional course from (a) and an additional course from (b) are required.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Women's Studies

### Subject abbreviation: WMST

### College of Humanities, Arts, and Social Sciences

Alicia Arrizón, Ph.D., Chair  
Department Office, 2033 CHASS INTN  
(951) 827-6427; [womensstudies.ucr.edu](http://womensstudies.ucr.edu)

### Professors

Alicia Arrizón, Ph.D.  
Christine Ward Gailey, Ph.D.  
(Women's Studies/Anthropology)  
Marguerite R. Waller, Ph.D. (Women's Studies/  
Comparative Literature and Foreign Languages)

### Associate Professor

Amalia Cabezas, Ph.D.

Piya Chatterjee, Ph.D.  
Jane Ward, Ph.D.

### Assistant Professors

Tracy Fisher, Ph.D.  
Sherine Hafez, Ph.D.  
Tamara Ho, Ph.D.  
Chikako Takeshita, Ph.D.  
\*\*

## Major

The Women's Studies Department offers a coherent interdisciplinary curriculum with a major field of study in the areas of gender and sexuality. Each student is required to take a total of 13 courses.

At the upper-division level, the department provides concentrations in gender and cultural production, gender and families, sexualities and gender, and gender and work.

## University Requirements

See Undergraduate Studies section.

## College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

## Major Requirements

The major requirements for the B.A. degree in Women's Studies are as follows:

- Lower-division requirements (three courses [at least 12 units])
  - WMST 001
  - One of the following: WMST 010; WMST 020; WMST 030 or WMST 030H
  - One additional lower division WMST course
- Upper-division requirements (ten courses [at least 40 units])
  - WMST 100
  - WMST 191A and WMST 191B
  - WMST 195 or WMST 198G
  - Six courses of electives chosen from the list below with the following distribution requirements:
    - One course focusing on African American women, Asian American women, Chicanas/Latinas, or Native American women in the United States or on women from societies in Latin America, Asia, the Middle East, or Africa
    - One course focusing on issues of sexuality, sexual orientation, sexual identification, or masculinity and femininity
    - The following courses may only be counted one time towards the major: WMST 190, WMST 195, WMST 198G

## Elective Course Work

Upper-division Women's Studies courses or courses in another department that are cross-listed with Women's Studies.

Closely related upper division courses from other programs or departments may be substituted upon approval.

## Minor

The minor in Women's Studies consists of six courses (at least 24 units) distributed as follows:

- Lower-division requirements (two courses [at least 8 units])
  - WMST 001
  - One WMST lower division course
- Upper-division requirements (four courses [at least 16 units])
  - WMST 100
  - Three upper division WMST courses.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

## Education Abroad Program

The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details visit UCR's International Education Center at [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or call (951) 827-4113.

See Education Abroad Program under International Education Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Programs and Courses section. Search for programs by specific areas at [eap.ucop.edu/programwizard](http://eap.ucop.edu/programwizard).

## Lower-Division Courses

**WMST 001. Gender and Sexuality (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to theories of sex and gender differences, the origins of patriarchy, and variations in sexual behavior and sexual norms. Credit is awarded for only one of WMST 001 or WMST 001H. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 001H. Honors Gender and Sexuality (4)** Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to WMST 001. An introduction to theories of sex and gender differences, the origins of patriarchy, and variations in sexual behavior and sexual norms. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of WMST 001 or WMST 001H. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 010. Women and Culture (5)** Lecture, 3 hours; written work, 3 hours; individual study, 1 hour; outside research, 2 hours. Prerequisite(s): none. Topics include the roles of women in cultural creation and production; the relation of women artists to the societies of their time; and the images of women in the art and literature of the modern world. Themes and periods covered may vary. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 011. Media Imagery of Women and Class (4)**

Lecture, 3 hours; discussion, 1 hour. Examines how mass media portray class as a gendered category. The approach is comparative and historical, integrating social sciences and humanities to analyze images of women portrayed as poor, working class, middle class, or wealthy. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 020. Women, Feminism, and Society in a Global Perspective (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. An introduction to the social, political, and legal concerns surrounding women's issues and feminist movements worldwide. Examines topics such as abortion, contraception, and sexual violence within a comparative and international framework. Credit is awarded for only one of WMST 020 or WMST 020H. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 020H. Honors Women, Feminism, and Society in a Global Perspective (5)**

Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to WMST 020. An introduction to the social, political, and legal concerns surrounding women's issues and feminist movements worldwide. Examines topics such as abortion, contraception, and sexual violence within a comparative and international framework. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of WMST 020 or WMST 020H. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 022A. Introduction to World Literature by Women (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to world literature by women across many centuries. Covers the creative work of women from ancient to early modern periods, examining both texts and the historical circumstances of the earliest women writers. Emphasis is on texts originally written in languages other than English, from around the globe. Cross-listed with CPLT 022A. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 022B. Introduction to World Literature by Women (4)**

Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the increasingly powerful voices of women writers in modernity and postmodernity. Emphasis is on texts originally written in languages other than English, from around the globe. Topics include the question of feminine writing and feminist theories about literature by women. Cross-listed with CPLT 022B. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 030. Violence against Women (4)**

Lecture, 3 hours; individual study, 3 hours. Addresses structural and interpersonal forms of violence against women and girls. Topics include sexual and physical abuse, rape and sexual assault, battering, body mutilation, forced sterilization or reproduction, sex selection, medical "silences," political torture, and gender-specific socialization for victimization and aggression. Also discusses state and economic policies. Credit is awarded for only one of WMST 030 or WMST 030H. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 030H. Violence Against Women (4)**

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to

WMST 030. Addresses structural and interpersonal forms of violence against women and girls. Topics include sexual and physical abuse, rape and sexual assault, battering, body mutilation, forced sterilization or reproduction, sex selection, medical "silences," political torture, and gender-specific socialization for victimization and aggression. Also discusses state and economic policies. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of WMST 030 or WMST 030H. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 031H. Latina Women in Literature and Culture (4)**

Seminar, 3 hours; extra reading, 1 hour; outside research, 1 hour; term paper, 1 hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Analyzes the literatures and cultures of Latin American women and U.S. Latinas. Examines the "roles" prescribed for women and the relationship of those roles to issues of power and authority through texts that acknowledge a tradition of feminine or feminist expression. Satisfactory (S) or No Credit (NC) grading is not available. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 040. Women, AIDS, and the Global Economy (4)**

Lecture, 3 hours; outside research, 2 hours; individual study, 1 hour. Examines the relationship between poverty, inequality, gender, and HIV/AIDS. Analyzes gender and other forms of social inequality that place women at higher risk for the virus. Explores how global structural inequalities impact the lives of women in the global south, as well as considers the conditions of marginal groups in the global north. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

## Upper-Division Courses

**WMST 100. Gender Theory (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural, multidisciplinary course investigating the development of feminist theory and exploring the construction of gender and sexuality, with emphasis on the "female" and the "feminine" in a variety of cultural contexts. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 101. Women, Work, and Capitalism (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): WMST 001 or WMST 001H or consent of instructor. Examines how class, race, and sexual inequalities impact, contest, and shape gender identities and relations. Analyzes patterns of women's work in the new international division of labor through case studies of export processing zones, reproductive labor, and sex tourism. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 103. Sexualities and Culture (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): WMST 001 or consent of instructor. Examines the field of sexuality studies using a comparative, cross-cultural approach. Emphasizes the relation between culture, history, and political economy in the emergence of sexual practices and sexualized identities. Examines theories of sexuality and identity, with particular attention to violence, human rights, and political agency. Cross-listed with ANTH 145. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 105. Women, Race, and Violence: Intersectionalist and Transnational Perspectives (4)**

Lecture, 3 hours; screening, 8 hours per quarter; extra read-

ing, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduces the theories of violence against women through intersectionalist feminist perspectives. Involves the analysis of violence simultaneously marked by race, ethnicity, nation, class, and sexual orientation. Compares cross-cultural and transnational perspectives. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 106. Feminist Bioethics (4)**

Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An exploration of the ways in which feminist theory provides insight on contemporary issues in bioethics. Topics include women in clinical research, cosmetic surgery, abortion, contract gestation, fetal protection policies, and the politics of mental illness. Cross-listed with PHIL 171. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 107. Feminisms, Race, and Antiracisms: Critical Theories and Intersectional Perspectives (4)**

Seminar, 3 hours; extra reading, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines how path-breaking scholarship by women of color in the United States and in developing countries has been central to rethinking theoretical foundations and to new ways of knowing, understanding, and practicing politics. Focuses on scholarship that critiques and analyzes issues concerning race, antiracism, human rights, citizenship, empire, globalization, and social justice. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 108. Philosophical Issues of Race and Gender (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates philosophical issues concerning race and gender. Themes include the role of cultural and biological criteria in defining these concepts; the roles of race and gender in personal identity; the nature of racism, sexism, and their variants; and policy implications such as affirmative action and the civil status of homosexual relationships. Cross-listed with PHIL 108. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 109. Women, Politics, and Social Movements: Global Perspectives (4)**

Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to "Third World" women's politics. Covers women's politics from a global perspective. Although international in breadth, emphasis is placed on South Asia, sub-Saharan Africa, and the Caribbean. Cross-listed with ANTH 109. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 110. Vienna: Sensuality and Seduction (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Cultural study of Vienna from fin de siècle to the present through literature, film, philosophy, and the visual arts. Topics include sexuality, visual desire, crisis of language, anti-Semitism, and the post-World War II confrontation with the Nazi period. All readings are in English; selected readings in German for German majors and minors. Cross-listed with CPLT 110A, EUR 110A, and GER 110A. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 122. Gender in Southeast Asian Diasporic Literature and Film (5)**

Lecture, 3 hours; screening, 3 hours; written work, 1 hour; extra reading, 2 hours.

Prerequisite(s): upper-division standing or consent of instructor. Looks at former Indochinese refugees who are producing literature and films in the United States and France. Examines how “Indochina” has been constructed, and in particular, has been gendered female in the colonial imaginary. Explores how Southeast Asian immigrants are returning to the Western gaze. Cross-listed with MCS 142. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 123. Transnational Feminist Film and Media (4)** Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor.

Covers contemporary women’s and feminist film and media productions. Connects the forces of globalization and militarization with gender-related experiences of displacement, migration, immigration, diaspora, trafficking, and refugee status. Focuses on innovative uses of visual language signaling changes in notions of nation, identity, class, race, ethnicity, gender, and sexuality. Cross-listed with CPLT 123. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 124. Asian American Women: Writing the Self in Literature and Film (4)** Lecture, 3 hours; screening, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analyzes Asian American autobiographies and films written and directed by women. Explores why the genre of autobiography is enabling and contentious within Asian American women’s writings. Examines films to see how such women filmmakers contend with memory, gender, and identity. Cross-listed with MCS 123. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 125. Gender and Genocide (4)** Lecture, 3 hours; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): WMST 001 or WMST 001H or consent of instructor. Examines gendered dimensions of contemporary and historical genocides. Analyzes the ways gender ideologies intersect racialization and ethnic marking. Explores how gender shapes selection, forced labor, torture, and murder. Considers gender ideologies in relation to collective, institutional, and individual responses to genocide and genocidal campaigns. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 126. Gender, Sexuality, and Music in Cross-Cultural Perspectives (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of gendered performance genres from a number of cultures. Seeks to familiarize the student with gender-specific music and notions of gender that are often constructed, maintained, transmitted, and transformed through music and performance. Designed for students interested in music, anthropology, and gender studies. Cross-listed with ANTH 177 and MUS 126. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 127. Dance, Gender, Sexuality (4)** Lecture, 3 hours; outside research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores some of the ways that studying dance, an art form whose medium is the body, illuminates feminist, gender, and sexuality studies — and vice versa. Includes weekly video screenings and readings. No previous dance experience required. Cross-listed with DNCE 131. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 128. Critical Approaches to Heterosexuality (4)** Lecture, 3 hours; extra reading, 2 hours; written work, 3 hours. Prerequisite(s): LGBS 001 or WMST 001 or WMST 001H. Examines the late nineteenth-century origins and twentieth-century evolution of the meaning of heterosexuality in the United States. Includes the medical, psychological, and political history of heterosexuality; the race and gender components of heterosexuality; and the intersections of heterosexuality and queerness. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with LGBS 128. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 132. U.S. Women, Gender, and Sexuality: 1620-1850 (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers topics in early American women’s lives—work, politics, and sexuality—while charting the developments of gendered systems in the United States. Topics may include masculinity, the rise of the middle class, and the private-public dichotomy. Cross-listed with HISA 132. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 133. Women, Gender, and Sexuality in U.S. History: 1850-Present (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces students to major themes in the history of U.S. women and gender issues. Drawing upon recent work in the field, it explores the relationships between gendered meanings of politics and the politics of gender in the late nineteenth and twentieth centuries in the United States. Cross-listed with HISA 133. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 134. Queer Identities and Movements in the United States (4)** Lecture, 3 hours; extra reading, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines important twentieth- and twenty-first century developments in queer culture and activism in the United States. Focuses on the origins of sexual identity; the relationship between sexuality, race, and gender; queer representation in art and media; and central issues in queer theory. Cross-listed with LGBS 134. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 135. Love, Desire, and Lesbian Sexuality (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Expands upon the notion of lesbian identification and sexuality. Emphasizes the influence of feminism on the interdisciplinarity of lesbian studies and the complexity of lesbianism across class, race, ethnic, age, and national and international differences. Cross-listed with LGBS 135. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 136. Women and Grassroots Organizing in the United States (4)** Seminar, 3 hours; extra reading, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Considers the complexity of women’s experiences within the context of culture, society, political economy, and history. Examines challenges that women face in a society that creates divisions based on race, class, and gender. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 137. Critical Queer Politics (4)** Lecture, 3 hours; individual study, 2 hours; written work, 1 hour.

Prerequisite(s): WMST 001 or WMST 001H or consent of instructor. Presents Euro-American configurations of modern sexuality to map queer communities and homosexual presence across time and space. Critically explores the invisibilities, injustices, erasures, distortions, silences, and voices produced as a result of queer mobility, global gay and global queer liberation. Cross-listed with LGBS 137. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 138. Gender and the Sex Trade (4)** Lecture, 3 hours; extra reading, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Addresses structural issues related to sexualized entertainment, including pornography, sex work, escort services, sex tourism, erotic dancing, and strip shows. Discusses how gender, race, class, citizenship, and sexuality shape the stratification of the industry. Analyzes how issues such as HIV/AIDS, traffic in women, forced prostitution, and child prostitution impact the sex trade and people working in this industry. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 139. Coming Out and Sexual Identity (4)** Lecture, 3 hours; individual study, 1 hour; extra reading, 2 hours. Prerequisite(s): LGBS 001 or WMST 001 or WMST 001H or consent of instructor. Examines speech acts, secrecy, and silence to understand the significance of the closet. Explores perspectives on resistant movements and modes of communication related to coming out. Considers coming out stories, biographies, examinations of the social construction of heterosexual identities and formation of public space. Cross-listed with LGBS 139. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 140. Reproduction: Policies, Politics, and Practices (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing. Examines reproductive policies, politics, and practices from a cross-cultural and historical perspective. Discusses political and economic processes and socio-cultural dynamics, population control, sex preference, infanticide and neonatal neglect, adoption and foster parenting, abortion, technologically assisted conception, and gestational surrogacy. Cross-listed with ANTH 147. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 141. Ethics and Families (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of some of the ethical issues that arise in and with regard to families of different kinds. Issues may include gender relations in “traditional marriages”; the ethics of same-sex marriage; the morality of abortion, surrogate mothering, and cloning; the justice of school vouchers; the grounds for universal health care; and possible gender inequalities in divorce. Cross-listed with PHIL 168. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 142 (E-Z). Women’s Writing in Modern Asia and Asian America (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers comparative histories of feminist literary movements, gender and immigration, autobiography, translation, and subjectivity. Asian literature will be circulated in the original language to students with reading ability (not required). E. Chinese and Chinese American Writing; J. Japanese and Japanese American Writing; K. Korean and Korean American Writing; V. Vietnamese and Vietnamese

American Writing. Cross-listed with CPLT 142 (E-Z). *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 146. History of Native American Women (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected important aspects of the lives of Native North American women, including their political, economic, and religious participation in their societies. Further traces historic changes in Native women's lives as a result of the colonization of the New World and examines the complex imagery of Native women that developed from colonial contact. Cross-listed with HISA 146. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 149. Gender, Kinship, and Social Change (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): WMST 001. Examines theories of gender and kinship, the formation of gender hierarchies and their uneven development, and the dynamics of "family" and gender in stratified social formations. Analyzes the relationship between family forms and political and economic processes. Cross-listed with ANTH 149. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 150. Gender and the State (4)**

Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the various meanings of gender as it is articulated in, reproduced by, and shaped within the state. Discusses gender-state relations, the engendering of politics, state functions, policy, and politics in various historical, political, cultural, and social contexts. Cross-listed with ANTH 148. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 151. Islam, Women, and the State (4)**

Lecture, 3 hours; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the links between women, Islamic practices, and the politics of state formation and nation building. Explores ways women constitute the terrain of struggle between the traditional and modern, colonialism and nationalism, and religion and politics. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 152. Theory of Gender Inequality (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): WMST 001 or WMST 001H. Studies theoretical debates regarding sex and gender differences; the origins and institutionalization of gender inequality; and the intersection of sexism, racism, and heterosexism. Cross-listed with LGBS 152. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 155. Women's Labor and the Economy (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 003 or ECON 004. Focuses on economic analyses of four topics: women's work in and out of the paid labor force; gender differences in occupation, earnings, and income; marriage, divorce, and childbearing; and public policy regarding women's work and standard of living. Explores differences among women by race, ethnicity, class, marital status, and parental responsibilities. Cross-listed with ECON 155. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 156. Women and Citizenship (4)** Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; written work, 1 hour; . Prerequisite(s): upper-division standing or consent of instructor. Explores women's citizenship in light of global movements of people, capital, and social and political rights.

Examines what it means to be a citizen and the ways in which women are included or excluded from that category. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 160. Women and Religion (4)**

Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): consent of instructor. Examination of attitudes toward and images of women in diverse religious traditions, including such issues as the presence and absence of women in leadership roles, women's spiritual experience, female founders of religious groups, and recent developments in feminist religious thought. Cross-listed with RLST 160. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.* O'Connor

**WMST 161. Gender and Science (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): WMST 001 or WMST 001H. Focuses on the intersections of Western constructions of gender and scientific knowledge since the sixteenth century. Considers the cultural and political roles of the scientist in terms of gender, the structuring of objectivity and objects of study, the status of scientific knowledges, and the emergence of feminist science studies. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 162. Women's Issues in Modern Muslim Thought (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Introduces complex religious and social issues related to the role of women in modern Islamic societies ranging from North America to Southeast Asia through an examination of Muslim writings produced during the past century. Cross-listed with RLST 162. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 163. The Women of Early Christianity (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the social roles and literary constructs of early Christian women as evidenced in the New Testament, patristic, and Apocryphal writings. Also considers the significance of those textual traditions for later Western ideas about women's social roles, including traditional and feminist theories. Cross-listed with RLST 163. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 164. Gender and Development in Latin America (4)**

Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Discusses the role and contribution of Latin American and Caribbean women within their societies. The effects of national economic development policies upon their status and their participation in and integration into the policy-making process are emphasized. Cross-listed with ANTH 164 and LNST 164. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 165 (E-Z). Themes in Vietnamese Literature (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An exploration of Vietnamese literature in translation, as seen through the lens of a particular theme or issue. Segments pay particular attention to

the implications of gender and sexuality on nation formation. All materials are read or viewed in English. E. Women and War. Cross-listed with AST 165 (E-Z) and VNM 165 (E-Z). *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.* Beevi Lam

**WMST 166. Chicana/o Cultural Studies and Gender Politics (4)**

Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the field of Chicana/o cultural studies and investigates the gender politics that attest to its intersectional approach. Considers how power and gendered politics have impacted the restructuring of the split subject in Chicana/o cultural studies. Cross-listed with MCS 127. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 167. Women and Gender in Postcolonial Africa (4)**

Lecture, 3 hours; extra reading, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing. Explores the relation between Africa and the Western world. Examines systems of colonialism and globalization, as well as the issue of woman, gender identity, and representation in postcolonial Africa. Highlights the impact of these issues on African society, as well as the struggle against systematic practices of oppression that persist at the axis of race, gender, and sexuality. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 168. Gender and Power in Muslim Societies (4)**

Lecture, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the dynamics of gender relations within the context of the Muslim world. Analyzes processes of power which influence concepts of femininity, masculinity, and the body and sexuality. Explores heterogeneity of the Muslim world, as well as its unifying cultural and social history. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 169. Gender, Identity, and Visual Display in Washington, D.C. (4)**

Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): admission to the UCR Washington Center Program. Examines the image of women and the role of women in fashioning visual culture through museums and collections in Washington, D.C. Investigates the representation of women in art; the woman artist; and women as patrons, donors, and decorators in Washington. Cross-listed with AHS 166. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 170. Women Artists in Renaissance Europe, 1400-1600 (4)**

Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): AHS 017B or upper-division standing or consent of instructor. Surveys the lives and work of women artists in Renaissance Europe from perspectives offered by the latest scholarly literature. Key topics considered are circumstances under which it was possible for women to become artists, how these women evolved from artists practicing in the cloistered convent to artists participating in the competitive public market place, what they painted, and who their patrons were. Cross-listed with AHS 165 and HISE 133. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 175. Gender, Ethnicity, and Borders (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001 or WMST 010 or upper-division standing.

Examines literary, theatrical, and visual sites where the “in-between” space of border cultures is mapped. Materials include autobiographies, testimonial literature, films, novels, performance scripts, and art. The interplay of gender and ethnicity is the special focus. Cross-listed with ETST 175. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 176. Gender, Human Rights, and Transnationalism (4)** Lecture, 3 hours; individual study, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores dynamics of gender and power in human rights activism. Examines the history and evolution of human rights discourse, discourses of liberation, and critical responses to the strategy of framing women’s rights as human rights in a comparative, transnational framework. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 178. Gender and Archaeology (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 005 or WMST 001 or consent instructor. Considers gender roles in ancient and historically recent human societies, as well as how gender has shaped archaeological investigation. Cross-listed with ANTH 178. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 179. Gender, Media, and Latin America (5)** Lecture, 3 hours; screening, 3 hours; outside research, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores the way Latin Americans have thought of and represented gender across a variety of media, including essays, film, novel or short story, and performance. Compares the possibilities and limitations of these media for representing gender in the Latin American context. Cross-listed with LNST 109, MCS 179, and SPN 179. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 185. Gender, Race, and Medicine (4)** Lecture, 3 hours; written work, 1 hour; extra reading, 1 hour; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the relationship between Western medicine and women, racial minorities, and non-Western citizens. Investigates how gender ideology, racial inequity, and colonialism shape the medical representation of bodies, sexuality, and pathology. Examines how patients have renegotiated their relationships with medicine through health movements and alternative healing practices. Cross-listed with ANTH 143. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 186. Gender, Power, and Shifting Identities (4)** Lecture, 3 hours; extra reading, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores constructions of various identities (racialized, gendered, sexual, diasporic) in cross-cultural contexts. Examines contemporary issues and theorizations concerning the intersection and politics of race, gender, and identity. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 187. Women, Gender, and Technology (4)** Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): WMST 001 or WMST 001H. Introduces historical and sociological studies of gender and technology. Examines how women have been affected by technological developments and how gender ideologies informed the design and implementa-

tion of various technologies. Explores the relations among technology, material culture, sustainability, and power. Technologies covered include those in the household, the workplace, and cyberspace. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 188. Gender and Performance (4)** Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on theoretical debates that construct and inform relations between the concepts of gender and performance. Considers the ways gendered bodies have been represented in performance. A broad definition of performance is applicable, and texts cover photographs, films, dance, performance art, drama, and current events. *Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 189. Gender, Technology, and the Body (4)** Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): LGBS 001 or WMST 001 or WMST 001H. Examines various technologies that alter the body. Investigates how technological interventions in the body reproduce and reshape gender ideologies in contemporary Western culture. Topics include cosmetic, sex-reassignment, and weight loss surgeries; reproductive, contraceptive, and medical technologies; antidepressants; sex toys; and body piercing. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 190. Special Studies (1-4)** Individual study, 3-12 hours. Prerequisite(s): upper-division standing or consent of instructor. Independent study and research by qualified undergraduate students.

**WMST 191A. Seminar in Women’s Studies: Feminist Epistemologies (4)** Seminar, 3 hours; extra reading, 2 hours; outside research, 1 hour. Prerequisite(s): WMST 100; consent of instructor. Explores what constitutes knowledge in feminist research, as well as knowledge production as a process. Examines the epistemological questions that feminist scholars and activists debate. Subject matter represents interdisciplinary feminist approaches. *Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 191B. Seminar in Women’s Studies: Feminist Research Methods (4)** Seminar, 3 hours; extra reading, 1 hour; outside research, 1 hour; term paper, 1 hour. Prerequisite(s): WMST 100; consent of instructor. Explores the development and definitions of feminist research methodologies. Analyzes debates within quantitative and qualitative social science research methods from a feminist perspective. Investigates ethical dilemmas in feminist research. Considers how research and activism are joined. *Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.*

**WMST 195. Senior Thesis (4)** Thesis, 12 hours. Prerequisite(s): WMST 100; senior standing; consent of instructor. Thesis composition under the guidance of a faculty member. Course is repeatable to a maximum of 8 units. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

**WMST 198G. Group Internship in Women’s Studies (4)** Seminar, 1.5 hours; internship, 8 hours.

Prerequisite(s): upper-division standing; consent of instructor. Examines gender issues in gender/sexualities advocacy organizations. Addresses methods of, support for, outreach by, and practices of gender advocacy workplaces. Includes supervised experience in community settings, such as a women’s advocacy organization, a sexualities advocacy organization, or a gender-oriented organization. *Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.*

## Graduate Courses

**WMST 290. Directed Studies (1-6)** Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair. Addresses special curricular problems. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

**WMST 292. Concurrent Analytical Studies in Women’s Studies (1-4)** Outside research, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Taken concurrently with a 100-series course. Focuses on research, criticism, and written work. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

## Professional Course

**WMST 302. Teaching Practicum (2-4)** Seminar, 2 hours; outside research, 1 hour; practicum, 1-2 hours; extra reading, 2-3 hours. Prerequisite(s): appointment as a teaching assistant in the Department of Women’s Studies. Supervised training for teaching in lower- and upper-division Women’s Studies courses. Seminar considers feminist pedagogy, including gender and dynamics in the classroom; comparative and historical approaches to teaching about gender and sexuality; techniques for discussing sensitive topics; providing resource referrals for students facing gender or sexuality issues; preparation; grading written work; and student relations. Graded Satisfactory (S) or No Credit (NC).

**Christopher Abani (2005)**

Professor, Creative Writing  
B.A., Imo State University; West Africa;  
M.A., Birbeck College, London;  
M.A., Ph.D., University of Southern California

**Reza Abbaschian (2005)**

Distinguished Professor, Mechanical  
Engineering  
B.S., University of Tehran;  
M.S., Michigan Technological University,  
Houghton, MI;  
Ph.D., UC Berkeley

**Byron Adams (1989)**

Professor, Music  
B.M., Jacksonville University;  
M.M., University of Southern California;  
D.M.A., Cornell University

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Vice Chancellor, Finance and  
Business Operations ..... Gretchen Bolar  
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Dean, School of Medicine ..... G. Richard Olds  
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University Librarian ..... Ruth Jackson  
Vice Provost, Academic Personnel ..... David Bocian  
Vice Provost, Administrative Resolution ..... David Funder  
Vice Provost, Undergraduate Education ..... Steven Brint  
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and Physical Planning ..... Tim Ralston  
Associate Vice Chancellor, Computing  
and Communications ..... Charles Rowley  
Associate Vice Chancellor, Design and  
Construction Sustainability ..... Don Caskey  
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Associate Vice Chancellor, Diversity,  
Excellence, and Equity ..... Yolanda Moses  
Associate Vice Chancellor, Facilities ..... Mike Miller  
Associate Vice Chancellor, Financial  
Services ..... Bobbi McCracken  
Associate Vice Chancellor, Human Resources ..... Marilyn G. Voce  
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..... Craig Sheward  
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Planning and Budget ..... Matthew Hull  
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General Operations ..... William Kidder  
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Assistant Vice Chancellor,  
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and Dean of Students ..... Susan Allen Ortega  
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Assistant Vice Provost, Academic Personnel ..... Katina Napper

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Associate Dean, Graduate Studies  
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Associate Dean, Humanities and Arts .....Georgia Warnke, Ph.D.  
Associate Dean, Student Academic Affairs .....Steven Brint, Ph.D.  
Assistant Dean and Chief Financial and  
Administrative Officer .....Nathaniel Jones, Ph.D.

### College of Natural and Agricultural Sciences

Dean .....Thomas Baldwin, Ph.D.  
Divisional Dean, Agricultural & Natural Resources ...Timothy Paine, Ph.D.  
Divisional Dean, Life Sciences .....Richard Cardullo, Ph.D.  
Associate Dean, Student Academic Affairs ...Michael McKibben, Ph.D.  
Divisional Dean, Physical and  
Mathematical Sciences .....Jory Yarnoff, Ph.D.  
Executive Assistant Dean of Administration  
and Chief Financial Officer .....Millie Garrison, M.B.A.

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UCR SOM and Associate Dean, UCR/UCLA Thomas  
Haider Program in Biomedical Sciences .....Craig V. Byus, Ph.D.  
Senior Associate Dean, Student Affairs, UCR SOM  
and Associate Dean, UCR/UCLA Thomas  
Haider Program in Biomedical Sciences .....Neal Schiller, Ph.D.  
Director, Clinical Instruction .....Stewart Shankel, M.D.  
Associate Director, Clinical Instruction .....Lawrence K. Loo, M.D.  
Graduate Advisors .....Monica Carson, Ph.D.  
.....Iryna Ethell, Ph.D.

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Associate Dean .....Leah Haimo, Ph.D.

### Graduate School of Education

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Assistant Dean, Academic Programs &  
Student Affairs, and Director,  
Teacher Education Services .....Anne Jones, Ed.D.  
Graduate Advisors .....Margaret Nash, Ph.D.  
.....Robert Ream, Ph.D.

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Associate Dean, Research  
and Graduate Studies .....Mark Matsumoto, Ph.D.  
Associate Dean, Undergraduate  
Education .....Chinya Ravishankar, Ph.D.  
Assistant Dean, Finance  
and Administration .....D. Patrick Hartney, M.B.A.

### The School of Business Administration and The A. Gary Anderson Graduate School of Management

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Assistant Dean, Executive Programs .....Jack Gregg, Ed.D.  
Assistant Dean, M.B.A. Program .....Nahid Razavi, M.S.  
Assistant Dean, Undergraduate Business  
Programs .....Kazi Mamun, M.A.  
Executive Assistant Dean and Chief Financial  
and Administrative Officer.....Laurie Gustafson, M.B.A.

### University Extension

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Associate Dean for Academic Affairs .....Sue Teele, Ph.D.  
Associate Dean for International Programs  
.....Bronwyn Jenkins-Deas, M.Ed.  
Assistant Dean, Student and Instructional  
Support Services .....Sarah Sharp-Aten, M.A.

## UC Riverside Officers Emeriti

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Vice Chancellor Emeritus, Faculty  
Relations and Academic Support .....John B. Vickery, Ph.D.  
Vice Chancellor Emeritus,  
University Advancement .....James Erickson, Ed.D.  
Dean Emerita, Graduate Division .....Anne Kernan, Ph.D.  
Dean Emeritus, College of Natural  
and Agricultural Sciences .....Seymour D. Van Gundy, Ph.D.  
Dean Emeritus, Graduate School  
of Education .....Irving H. Balow, Ph.D.  
Dean Emeritus, Graduate School  
of Education .....Irving G. Hendrick, Ph.D.  
Dean Emeritus, University Extension,  
Riverside .....James R. Hartley, Ed.D.  
Registrar Emeritus .....Robert B. Herschler, M.A.

## Other UC Riverside Administrators

Executive Director, Academic Senate .....Sellyna Ehlers  
Executive Director, Associated Students of UCR ...Laurie Sinclair, B.A.  
Director, Audit and Advisory Services .....Michael R. Jenson, M.B.A.  
Coordinator, Campus Sexual Harassment/  
Title IX .....Debbie L. Artis, B.A.  
Director, Communications .....Jill Hishmeh, M.B.A.  
Director, Communications, Health Affairs .....Kathy Barton, B.A.  
Director, Community Relations .....Jeff Kraus, B.S.  
Director, Early Academic Development Programs .....Frances Calvin  
Director, Financial Aid .....Sheryl Hayes, B.S.  
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Director, Labor Relations .....Jadie Lee, M.B.A.  
Director, Major Gifts and Strategic Initiatives .....Pat Kohlmeier  
Director, Marketing .....Margene Mastin-Schepps, M.A.  
Director, Materiel Management .....Russell Lewis, C.P.M.  
Director, Media Relations .....Kristiana Lovekin, B.A.  
Registrar .....Bracken Janette Dailey, M.S.  
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Director, State Relations .....Susan McKee  
Interim Director, Strategic Academic  
Research and Analysis .....Gina Roque  
Director, Student Affairs  
Communications .....Patricia Daly, M.B.A.  
Director, Student Business Services .....Asirra Suguitan  
Director, Administration, Summer Sessions ...Leonard Taylor, M.F.A.  
Director, Undergraduate Admissions .....Merlyn Campos  
Deputy Director, Undergraduate Admissions ...Emily Engelschall, B.A.

## Chief Campus Officers

Provost 1949–56 .....Gordon S. Watkins  
Provost 1956–58; Chancellor 1958–64 .....Herman Spieth  
Chancellor 1964–1979 .....Ivan Hinderaker  
Chancellor 1979–1984 .....Tomás Rivera  
Acting Chancellor 1984–1985 .....Daniel G. Aldrich, Jr.  
Chancellor 1985–1987 .....Theodore L. Hullar  
Chancellor 1987–1992 .....Rosemary S.J. Schraer  
Chancellor 1992–2002 .....Raymond L. Orbach  
Acting Chancellor 2002 .....David H. Warren  
Chancellor 2002–2007 .....France A. Córdova  
Acting Chancellor 2007–2008 .....Robert D. Grey  
Chancellor 2008– .....Timothy P. White



# Alphabetical Legend

Building Name	Grid
Aberdeen-Inverness Residence Hall	E3
Administration (Hinderaker Hall)	C5
Agricultural Operations	B7
Alumni & Visitors Center	C, D4
Anderson Hall (SoBA, AGSM) 1 & 2	E7
Arts Building	C4-5
Arts 113-Studio Theatre	C, D4
Arts 166-Performance Lab	C5
Athletics & Dance Bldg (PE Bldg)	D4-5
Bannockburn Village	C3-4
Barr Group/University Club	D5-6
Batchelor Hall	E5
Bell Tower	E5
Biological Sciences	E5-6
Biomedical Teaching Complex	F5
Botanic Gardens	G, H6-7
Bourns Hall (Engineering)	E4
Boyce Hall	F5
Boydin Laboratories	E6
Campus Store	D, E4
Campus Surge	D4
Campus Tours (Student Services Building)	D5
Canyon Crest Family Student Housing	D, F 1-3
Career Center	E, F4
Chapman Hall	E6
CHASS Interdisciplinary North and South	D4-5
Chemical Sciences	F5
Child Development Center	E, F2
College Building North and College Building South	E7
Computing and Communications	F, G6
Corporation Yard	F2
Costo Hall	D5
Cottage	D6
East 1 & Q (Insectary)	F6
Entomology	E6
Entomology Museum	E6
Environmental Health and Safety	E7
Falkirk Apts	C, D2-3
Fawcett Laboratory	F6
Geology Building	E5
Glen Mor 1	G3
Genomics	E6
Greenhouses	F5-6
Headhouse (greenhouses)	F7
Health Center	E, F4

Herbarium	F6
Highlander Hall	B4-5
Highlander Union Bldg/Plaza (HUB)	D5
Hinderaker Hall (Administration)	C5
Housing Administration	C, D3
HUB (Highlander Union Building)	D5
Humanities	D, E6
Humanities 400/University Theatre	D6
Humanities & Social Sciences Building	C, D5
Humanities 1500	D5
Human Resources	B4
International Village Housing	B5
Keen Hall	E, F5
KUCR Radio	E, F3
Library, Orbach Science	F5
Library, Rivera	E5-6
Life Science Building	E5-6
Life Sciences 1500	E5
Lothian Residence Hall	F, G4
Materials Science & Engineering Building	D, E4
Oban Apts	C, D3
Olmsted Hall	E6
Orbach Library (Science Library)	F5
Parking Services	G3
Pentland Hills	F, G 3-4
Physics Building	E, F 4-5
Physics 2000	F5
Pierce Hall	E5
Police Facility	D3
Psychology Building	E6
Rivera Library	E5-6
Riverside Sports Complex	C1-2
School of Medicine Education Bldg (Stat Comp) (under construction)	F5
Schools First Credit Union	A3
Science Laboratories 1	E5
Science Library, Orbach	F5
Spieth Hall	E5
Sproul Hall	D5
Stat Comp (School of Medicine Education Bldg)	F5
Stonehaven Apts	C, D1
Student Recreation Center	D, E3
Student Services	D5
UCR Extension Center	B4-5
University Laboratory Building	E6

University Lecture Hall	D, E4
University Office Building	F6
University Plaza Apts. (The Plaza)	C3
University Theatre	D6
University Village	A, B3-4
University Village Theatre	A, B4
USDA Salinity Laboratory	G5
Watkins Hall	D5
Watkins 1000	D5
Webber Hall	E5
Winston Chung Hall (EBU2)	E4

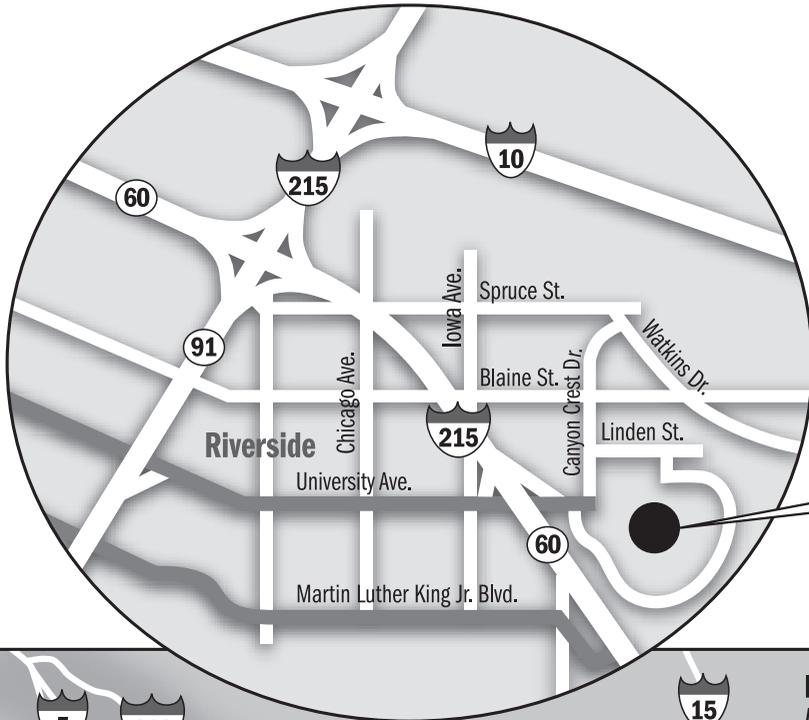
## Colleges and Schools

Bourns College of Engineering (BCOE)	E4
College of Humanities, Arts & Social Sciences (CHASS)	C, D5
College of Natural & Agricultural Sciences (CNAS)	E7
Graduate School of Education (GSOE)	D5
School of Business Administration (SoBA)	E7
The Anderson Graduate School of Management (AGSM)	E7

## Top UCR Destinations

Alumni & Visitors Center	C, D4
Athletics & Dance Bldg (PE Bldg)	D4-5
Campus Store	D, E4
Campus Tours (Student Services)	D5
Career/Counseling/Health Center (Veitch Student Center)	E, F4
Dining Services (Bannockburn Village)	C3
Highlander One-Stop Shop (Student Services)	D5
Housing Administration	C, D3
HUB (Highlander Union Bldg)	D5
Orbach Science Library	F5
Rivera Library	E 5-6
Student Recreation Center	D, E3
University Theatre	D6

# How to Get to UC Riverside



**UC RIVERSIDE**  
UNIVERSITY OF CALIFORNIA



# Two-Year Academic Calendar

## University of California, Riverside

### 2011–2012

### 2012–2013

#### FALL

Quarter begins	Mon	Sept 19	Mon	Sept 24
Instruction begins	Thur	Sept 22	Thur	Sept 27
<i>Veterans Day</i>	Fri	Nov 11	Mon	Nov 12
<i>Thanksgiving</i>	Thur–Fri	Nov 24–25	Thur–Fri	Nov 22–23
Instruction ends	Fri	Dec 2	Fri	Dec 7
Finals begin	Sat	Dec 3	Mon	Dec 10
Finals end/Quarter ends	Fri	Dec 9	Fri	Dec 14

#### WINTER

Quarter begins	Wed	Jan 4	Wed	Jan 2
Instruction begins	Mon	Jan 9	Mon	Jan 7
<i>Martin Luther King, Jr. Day</i>	Mon	Jan 16	Mon	Jan 21
<i>Presidents Day</i>	Mon	Feb 20	Mon	Feb 18
Instruction ends	Fri	March 16	Fri	March 15
Finals begin	Sat	March 17	Mon	March 18
Finals end/Quarter ends	Fri	March 23	Fri	March 22

#### SPRING

Quarter begins	Mon	March 28	Wed	March 27
<i>Cesar Chavez Holiday</i>	Fri	March 30	Fri	March 29
Instruction begins	Mon	Apr 2	Mon	Apr 1
<i>Memorial Day</i>	Mon	May 28	Mon	May 27
Instruction ends	Fri	June 8	Fri	June 7
Finals begin	Sat	June 9	Mon	June 10
Finals end/Quarter ends	Fri	June 15	Fri	June 14
Commencement	Fri–Mon	June 15–18	Fri–Mon	June 14–17

# Directory

**Campus Operator** .....(951) 827-1012

Dial 0 from campus telephones. Campus numbers not listed below are available in the campus directory, in the local telephone directory, or from the campus operator.

**Emergency Assistance**

Off campus .....911  
On-Campus telephones.....9-911

**Admission Offices**

Undergraduate Admissions—Application Evaluation .....827-3411

**Affirmative Action** .....827-5604

**Alumni and Constituent Relations**.....827-2586

**Associated Students of UCR**.....827-3621

**Campus Store (Bookstore)**.....827-2665

**Campus Tours** .....827-8687

**Career Center** .....827-3631

**Colleges and Schools**

College of Humanities, Arts, and Social Sciences .....827-3683

College of Natural and Agricultural Sciences.....827-6555

Division of Biomedical Sciences.....827-5705

Graduate Division .....827-4302

Graduate School of Education

Teacher education.....827-5225

Graduate program.....827-6362

The Marlan and Rosemary Bourns College of Engineering .....827-5190

The School of Business Administration and

The A. Gary Anderson Graduate School of Management.....827-6200

**Counseling Center**.....827-5531

**Financial Aid Office**.....827-3878

**Office of Graduate Admission**.....827-3313

**Health Center** (Campus Health Center).....827-3031

**Housing Information** .....827-6350

**International Education Center**.....827-4113

**Learning Center/Academic Resource Center** .....827-3721

Study Skills Programs, Tutorial Assistance, and Support Services

**Lesbian Gay Bisexual Transgender Resource Center** .....827-2267

**Library Information — Tomás Rivera** .....827-3220

**Library Information — Raymond L. Orbach Science Library** .....827-3701

**Ombudsperson** .....827-3213

**Office of the Registrar** .....827-7284

**Services for Students with Disabilities** .....827-4538

**Student Life** .....827-7344

Clubs, Recreation, Orientation, Tartan Soul

**Student Recreation Center**.....827-5738

**Student Special Services** .....827-3861

Veterans' Benefits

**Summer Sessions**.....827-3044

**Transfer Services** .....827-5307

**Transportation and Parking Services**.....827-8277

**Office of Undergraduate Admission**

Information for Prospective Students and Application Evaluation .....827-3411

**The Well**.....827-9355

**Women's Resource Center** .....827-3337

**My.UCR.edu**

[affirmativeaction.ucr.edu](http://affirmativeaction.ucr.edu)

[acr.ucr.edu](http://acr.ucr.edu)

[asucr.ucr.edu](http://asucr.ucr.edu)

[ucrcampusstore.ucr.edu](http://ucrcampusstore.ucr.edu)

**My.UCR.edu**

[careers.ucr.edu](http://careers.ucr.edu)

[chass.ucr.edu](http://chass.ucr.edu)

[cnas.ucr.edu](http://cnas.ucr.edu)

[biomed.ucr.edu](http://biomed.ucr.edu)

[www.graduate.ucr.edu](http://www.graduate.ucr.edu)

[education.ucr.edu](http://education.ucr.edu)

[education.ucr.edu](http://education.ucr.edu)

[www.engr.ucr.edu](http://www.engr.ucr.edu)

[agsm.ucr.edu](http://agsm.ucr.edu)

[counseling.ucr.edu](http://counseling.ucr.edu)

[finaid.ucr.edu](http://finaid.ucr.edu)

[www.graduate.ucr.edu](http://www.graduate.ucr.edu)

[campushealth.ucr.edu](http://campushealth.ucr.edu)

[housing.ucr.edu](http://housing.ucr.edu)

[internationalcenter.ucr.edu](http://internationalcenter.ucr.edu)

[www.arc.ucr.edu](http://www.arc.ucr.edu)

[out.ucr.edu](http://out.ucr.edu)

[library.ucr.edu](http://library.ucr.edu)

[library.ucr.edu](http://library.ucr.edu)

[ombudsperson.ucr.edu](http://ombudsperson.ucr.edu)

[registrar.ucr.edu](http://registrar.ucr.edu)

[specialservices.ucr.edu](http://specialservices.ucr.edu)

[studentlife.ucr.edu](http://studentlife.ucr.edu), [rside.ucr.edu](http://rside.ucr.edu),

[tartansoul.ucr.edu](http://tartansoul.ucr.edu)

[recreation.ucr.edu](http://recreation.ucr.edu)

[specialservices.ucr.edu](http://specialservices.ucr.edu)

[summer.ucr.edu](http://summer.ucr.edu)

**My.UCR.edu**

[parking.ucr.edu](http://parking.ucr.edu)

**My.UCR.edu**

[well.ucr.edu](http://well.ucr.edu)

[wrc.ucr.edu](http://wrc.ucr.edu)



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